VILLAGES AT TURF VALLEY
PHASE 5
ROAD, STORMWATER MANAGEMENT AND STORM DRAIN CONSTRUCTION PLANS

GENERAL NOTES

1. THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.

2. SUBJECT PROPERTY ZONED PGCC PER THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN.

3. THIS PROJECT IS SUBJECT TO THE THIRD AMENDED TURF VALLEY MULTI-USE SUBDISTRICT FINAL DEVELOPMENT PLAN RECORDED AS PLAT NUMBERS 21029-21031 ON MARCH 26, 2010.

4. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NO. 16E1 AND 0012 WERE USED FOR THIS PROJECT.

5. PROJECT BOUNDARY IS BASED ON BOUNDARY SURVEY BY JOHN B. MILDENBERG IN MARCH, 2006.

6. TOPOGRAPHY SHOWN IS BASED ON AERIAL TOPOGRAPHIC SURVEY PERFORMED BY WINGS AERIAL MAPPING CO., INC. FLOWN ON OR ABOUT JANUARY, 2006.

7. EXISTING UTILITIES SHOWN ARE BASED ON FIELD LOCATIONS, HOWARD COUNTY GIS AND SIGNED CONTRACT DRAWINGS.

8. THE WETLAND LOCATIONS SHOWN ON THE ADJACENT PROPERTIES ARE BASED ON APPROVED STUDIES AS SHOWN ON THE COMPREHENSIVE SKETCH PLAN OF TURF VALLEY. WETLANDS ARE BASED ON A STUDY CONDUCTED BY EXPLORATION RESEARCH FOR S-86-13 AND VERIFIED BY ECO-SCIENCE PROFESSIONALS, INC. IN JUNE 2002 AND APRIL 2004 (FOR DEVELOPMENT IN AND AROUND PODS I, K, L, M, N O, P, Q & S).

9. THE GEOTECHNICAL REPORT WAS PREPARED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC. ON MARCH 31, 2014.

10. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, THEIR REQUIRED BUFFERS EXCEPT THE DISTURBANCES THAT ARE ASSOCIATED WITH THE SEWER CONNECTION AND TEE TURNAROUND CONSTRUCTION AT THE END OF NASHVILLE COURT WHICH WAS DEEMED 'NECESSARY' BY THE DEPARTMENT OF PLANNING AND ZONING UNDER ECP-14-053.

11. THERE IS NO 100-YEAR FLOODPLAIN LOCATED ON THIS PROJECT SITE.

12. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERIES OR HISTORIC STRUCTURES LOCATED ON THIS SITE.

13. THERE ARE NO STEEP SLOPES (25% OR GREATER) ON THIS SITE.

14. WATER AND SEWER IS PUBLIC. THE CONTRACT NUMBER IS 24-4887-D. THIS SITE IS LOCATED WITHIN THE METROPOLITAN DISTRICT.

15. A NOISE STUDY IS NOT REQUIRED FOR THIS PROJECT AS NONE OF THE PROPOSED LOTS ARE LOCATED WITHIN 500 FEET OF THE I-70 (PRINCIPAL ARTERIAL) RIGHT-OF-WAY.

16. A TRAFFIC STUDY WAS PREPARED BY THE TRAFFIC GROUP IN JANUARY, 2005. IT WAS SUPPLEMENTED WITH A LETTER DATED SEPTEMBER 3, 2015 PREPARED BY THE TRAFFIC GROUP.

17. THIS PROJECT IS EXEMPT FROM HOWARD COUNTY FOREST CONSERVATION REQUIREMENTS UNDER SECTION 16.1202(b)(1)(iv) OF THE HOWARD COUNTY CODE SINCE IT IS A PLANNED UNIT DEVELOPMENT WHICH HAD PRELIMINARY DEVELOPMENT PLAN APPROVAL AND 50% OR MORE OF THE LAND WAS RECORDED AND SUBSTANTIALLY DEVELOPED BEFORE DECEMBER 31, 1992.

18. LANDSCAPING FOR THIS DEVELOPMENT IS BEING PROVIDED BY A CERTIFIED LANDSCAPE PLAN WHICH IS A PART OF THIS ROAD CONSTRUCTION PLAN SET IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF $15,600.00 FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT.

19. STORMWATER MANAGEMENT ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN PROVIDED TO THE MAXIMUM EXTENT PRACTICAL (MEP) VIA ONE (M-6) MICRO BIO-RETENTION PRACTICE, FIVE (F-6) BIO-RETENTION PRACTICES, TWO (M-2) SUBMERGED GRAVEL WETLANDS, TWO AREAS OF (N-2) DISCONNECTION OF NON-ROOFTOP RUNOFF. THE PRACTICES ARE PRIVATELY OWNED AND MAINTAINED

20. TRASH COLLECTION SHALL BE PUBLIC.

21. RECREATIONAL OPEN SPACE IS NOT REQUIRED AS THIS PROJECT IS ZONED PGCC.

22. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE OCTOBER 6, 2013. PER SECTION 126.0.H.1, PLANNING BOARD APPROVAL IS REQUIRED FOR THE SITE DEVELOPMENT PLAN FOR THIS PROJECT.

23. THE VILLAGES AT TURF VALLEY SUBDIVISION (PHASES 1-5) CONSTITUTED 241 TOTAL UNITS, WHICH MET THE SKETCH PLAN MILESTONE DATE OF JANUARY 1, 2001 THROUGH JUNE 30, 2002 FOR BOTH PHASE IVA (131 UNITS) & IVB (110 UNITS) AS ESTABLISHED BY THE REVISED PHASING PLAN DATED JUNE 21, 2000. UNDER P-06-013, 42 CONDOMINIUM UNITS THAT WERE APPROVED WERE USED FOR OAKMONT AT TURF VALLEY (F-02-082). THESE 42 CONDOMINIUM UNITS WERE NOT PREVIOUSLY INCLUDED WITH THE OAKMONT AT TURF VALLEY (F-02-82) PLANS. IN ORDER TO RECEIVE BUILDING ALLOCATIONS, THESE 42 CONDOMINIUM UNITS WERE SHOWN AND APPROVED ON THE PRELIMINARY PLAN FOR THE VILLAGES AT TURF VALLEY (P-06-013). THE SECOND AMENDMENT TO THE TURF VALLEY MULTI-USE FINAL DEVELOPMENT PLAN WAS RECORDED ON NOVEMBER 30, 2007, PLATS 19578-19580, INCREASING THE PROJECTED UNITS IN THE OAKMONT AT TURF VALLEY AREA FROM 150 TO 200. AS A RESULT, THOSE 42 UNITS ARE NO LONGER A PART OF THE VILLAGES AT TURF VALLEY WHICH LEAVES UNIT TOTAL AT 199. HOWEVER, WITH THE APPROVAL OF WP-08-009 AN ADDITIONAL 21 UNITS WERE ADDED TO THE VILLAGES AT TURF VALLEY. THE FINAL UNIT TOTAL FOR THE "VILLAGES AT TURF VALLEY" SUBDIVISIONS COMES TO 220.

24.) APPLICABLE DPZ FILE REFERENCES ARE:
S-86-13, S-03-01, ECP-14-053, 3rd AMENDED FDP PLAT #21029-21031, SP-15-003

25.) PRIOR TO GRADING PERMIT APPLICATION, THE PROJECT SHALL COMPLY WITH THE REQUIREMENTS OF SECTION 16.129 THE HOWARD COUNTY CODE.

26.) THE 36 UNITS/LOTS PROPOSED ON THIS PLAN ARE BEING TRANSFERRED FROM THE 59 LOTS/UNITS PREVIOUSLY APPROVED FOR VILLAGES AT TURF VALLEY, PHASE 3, F-08-085.

27.) STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

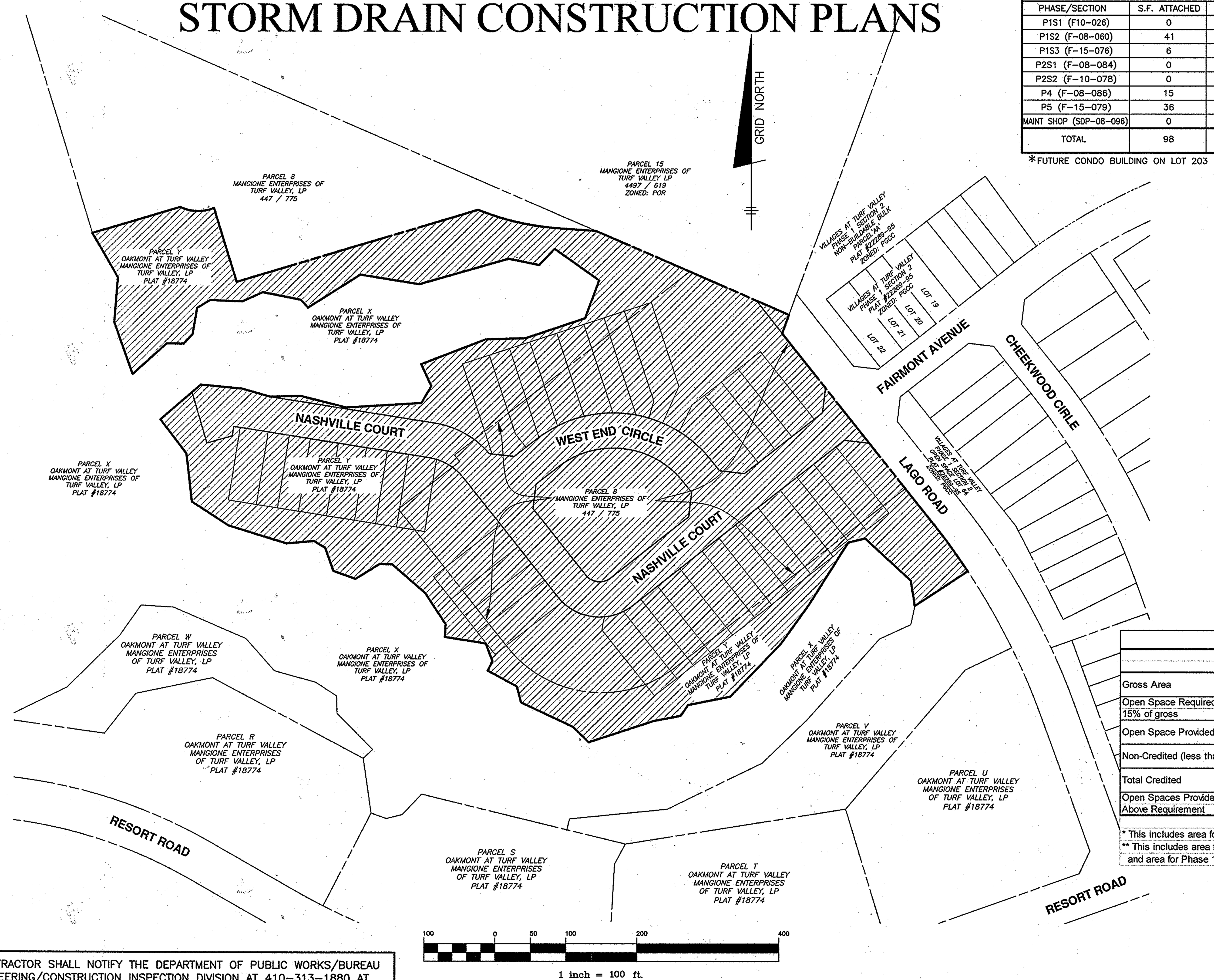
28.) ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.

29.) TRAFFIC CONTROL DEVICES:
A) THE R1-1 "STOP" SIGN AND STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.

B) THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2430) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.

C) ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MdMUTCD).

D) ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED "QUICK PUNCH", SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THEN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.



THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.

BENCHMARKS
NAD'83 HORIZONTAL

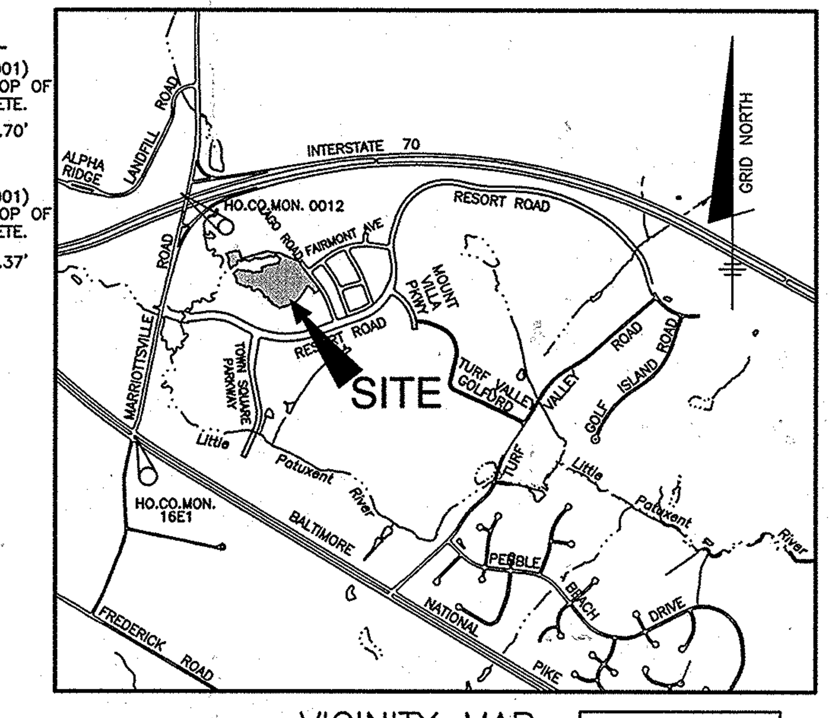
HO. CO. #16E1 (AKA: 3438001)
STAMPED BRASS DISK SET ON TOP OF A 3ft DEEP COLUMN OF CONCRETE.
N 593250.960' E 1340192.70'
ELEVATION: 463.981'

HO. CO. #0012 (AKA: 3439001)
STAMPED BRASS DISK SET ON TOP OF A 3ft DEEP COLUMN OF CONCRETE.
N 596502.760' E 1340864.37'
ELEVATION: 486.298'

VILLAGES AT TURF VALLEY PHASING CHART

PHASE/SECTION	S.F. ATTACHED	S.F. DETACHED	CONDOMINIUM	TOTAL
P1S1 (F10-026)	0	0	0	0
P1S2 (F-08-060)	41	21	0	62
P1S3 (F-15-076)	6	0	0	6
P2S1 (F-08-084)	0	0	44*	44
P2S2 (F-10-078)	0	48	0	48
P4 (F-08-086)	15	8	0	23
P5 (F-15-079)	36	0	0	36
MAINT SHOP (SDP-08-096)	0	0	1 (Access. Apt.)	1
TOTAL	98	77	45	220

*FUTURE CONDO BUILDING ON LOT 203



VICINITY MAP
SCALE: 1" = 2000'

ADC MAP: 19
GRID: D3

SITE ANALYSIS DATA CHART

GENERAL SITE DATA

1.) PRESENT ZONING: PGCC
2.) APPLICABLE DPZ FILE REFERENCES: ECP-14-053, SP-15-003
3.) PROPOSED USE OF SITE: RESIDENTIAL - SFA
4.) PROPOSED WATER AND SEWER SYSTEMS: PUBLIC

AREA TABULATION

1.) GROSS TRACT AREA 10.49 AC.±
2.) AREA WITHIN 100-YEAR FLOODPLAIN 0.00 AC.±
3.) TOTAL AREA OF 25% OR GREATER STEEP SLOPES 0.00 AC.±
AREA NOT IN FLOODPLAIN (FOR NTA CALC) 0.00 AC.±
4.) NET TRACT AREA 10.49 AC.±
5.) TOTAL NUMBER OF LOTS ALLOWED PER ZONING N/A
6.) TOTAL NUMBER OF RESIDENTIAL UNITS/LOTS PROPOSED ON THIS SUBMISSION 36
7.) AREA OF BUILDABLE LOTS 3.51± AC.
AREA OF OPEN SPACE LOTS 3.80± AC.
AREA OF BUILDABLE BULK PARCELS 1.42± AC.
AREA OF PUBLIC RIGHT-OF-WAY 1.76± AC.

OPEN SPACE CALCULATIONS

	Phase 1 Section 1	Phase 1 Section 2*	Phase 1 Section 3	Phase 2 Section 1**	Phase 2 Section 2	Phase 4	Phase 5	Total
Gross Area	6.25	27.75	NA	157.59	NA	NA	10.49	202.08
Open Space Required 15% of gross	0.94	4.16	NA	23.64	NA	NA	1.57	39.23
Open Space Provided	2.58	5.32	0.19	124.96	0.32	1.02	3.80	138.19
Non-Credited (less than 35' in width)	0.00	0.65	0.14	0.35	0.32	0.57	0.00	2.03
Total Credited	2.58	4.67	0.05	124.61	0.00	0.45	3.80	136.16
Open Spaces Provided Above Requirement	1.64	0.51	0.05	100.97	0.00	0.45	2.23	105.85

* This includes area for Phase 4 (Non-Buildable Bulk Parcel BB)
** This includes area for Phase 2, Section2 (Non-Buildable Bulk Parcels DD-1, EE-1 & FF-1) and area for Phase 1 Section 3 (Non-Buildable Bulk Parcel CC-1)

SWM PRACTICE CHART SUMMARY TABLE

Pe= 1.6 inches Qe= 0.66 inches ESDv= 21104 cf Rv= 0.41

Practice		DA to practice	Imp Area to practice	Af (s.f.) Required	Af (s.f.) Provided	Af (s.f.) 2% DA?	ESDv Required	ESDv Provided	ESDv Pe Provided	REv Required	REv Provided	Ownership
(M-6) Micro-Bioretention	#1	15,856	10,754	317	1011	PASS	1396	1,616	1.6			Private
(F-6) Bioretention	#1	29,464	17,567	589	1457	PASS	2304	2329	1.6			Private
(F-6) Bioretention	#2	60,505	22,311	1210	2420	PASS	3081	3632	1.6			Private
(F-6) Bioretention	#3	30,971	16,688	619	1620	PASS	2209	2483	1.6			Private
(F-6) Bioretention	#4	33,996	21,845	680	2340	PASS	2848	3546	1.6			Private
(F-6) Bioretention	#5	25,611	16,948	512	1708	PASS	2205	2754	1.6			Private
(M-2) Submereged Gravel Wetland	#1	34,986	20,197	NA	1424	NA	2657	2115	1.6			Private
(M-2) Submereged Gravel Wetland	#2	34,928	21,552	NA	1760	NA	2819	2741	1.6			Private
(N-2) Disconnection of Non-Rooftop Runoff	#1	1,337	1,337					100	1.0			Private
(N-2) Disconnection of Non-Rooftop Runoff	#2	1,633	1,633					122	1.0			Private
Total Treated	→	269,287	150,832	3,928	13,740		21,104	21,438	1.6	2745	2745	
Site Total	→	386,046	151,186									

354 sf of impervious not treated is the small portion of sidewalk & pavement at southeast corner of Lago Road.

APPROVED: DEPARTMENT OF PUBLIC WORKS
[signature] 9/8/2015
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[signature] 9-16-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE
[signature] 9.10.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

SHEET INDEX

SHEET	TITLE
1	TITLE SHEET
2	ROAD PLAN, PROFILE, DETAILS, SIGNAGE AND STREET LIGHTING NASHVILLE COURT
3	ROAD PLAN, PROFILE, DETAILS, SIGNAGE AND STREET LIGHTING WEST END CIRCLE
4	STORM DRAIN DRAINAGE AREA MAP
5	STORM DRAIN PROFILES
6	STORM DRAIN DETAILS
7	ESD STORMWATER MANAGEMENT DETAILS (F-6) BIORETENTION
8	ESD STORMWATER MANAGEMENT DETAILS (F-6) BIORETENTION
9	ESD STORMWATER MANAGEMENT DETAILS (M-6) MICROBIO AND (F-6) BIORETENTION
10	ESD STORMWATER MANAGEMENT NOTES AND DETAILS (M-2) SUBMERGED GRAVEL WETLANDS
11	PERIMETER LANDSCAPE AND STREET TREE PLAN
12	PERIMETER LANDSCAPE AND STREET TREE NOTES, CHARTS & DETAILS
13	GRADING, SEDIMENT & EROSION CONTROL PLAN
14	GRADING, SEDIMENT & EROSION CONTROL PLAN
15	SEDIMENT & EROSION CONTROL NOTES AND SEQUENCE OF CONSTRUCTION
16	SEDIMENT & EROSION CONTROL DETAILS AND SOIL BORING LOGS
17	SOIL BORING LOGS
18	RETAINING WALL PLAN

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.
[seal: STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — 22390 — REGISTERED — PROFESSIONAL ENGINEER] 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY
PHASE 5
LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 - GRID: 10 - PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND

TITLE SHEET

DATE: AUGUST, 2015 — BEI PROJECT NO. 2601
DESIGN: DBT — DRAFT: DBT — SCALE: AS SHOWN —

F-15-079

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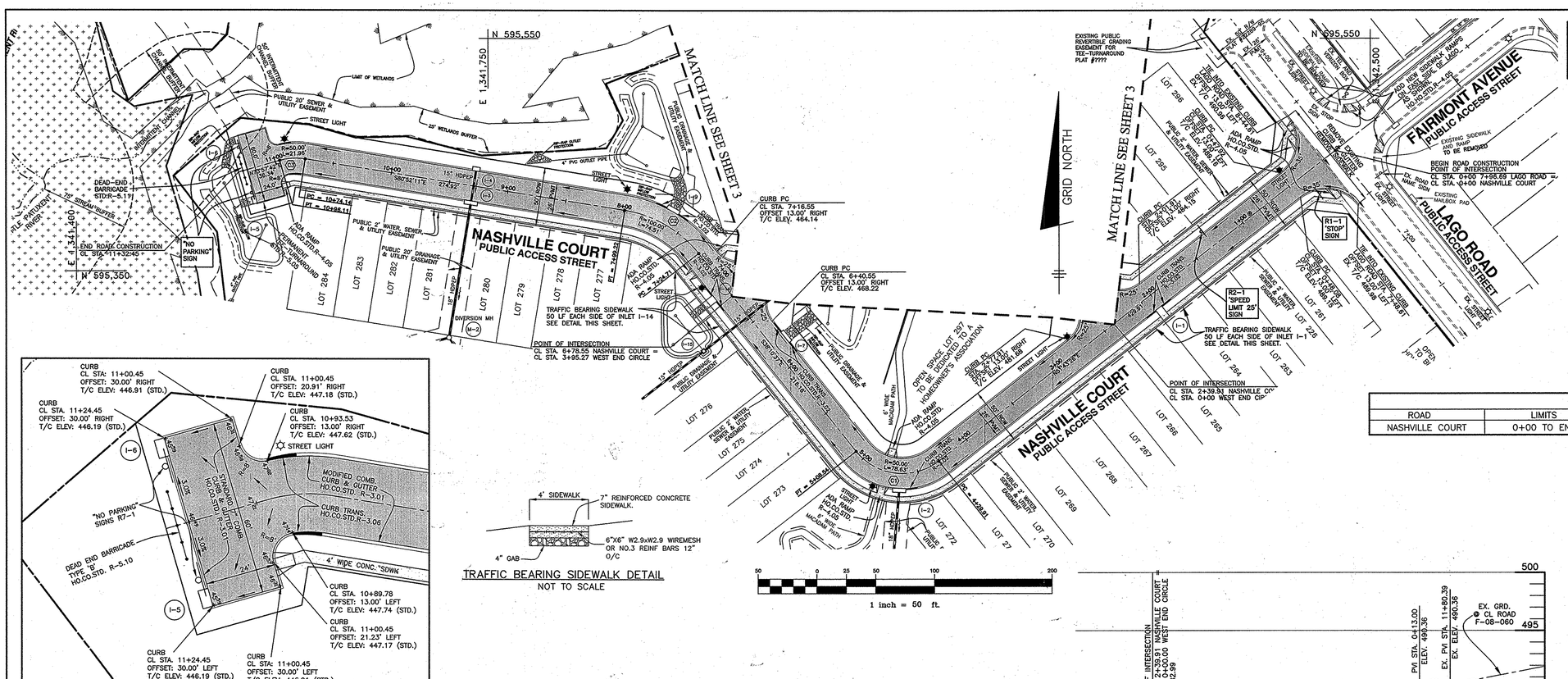


CENTER LINE CURVE DATA								
STREET NAME	CURVE	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD	
NASHVILLE COURT	C1	4+29.91 TO 5+08.54	50.00'	78.63'	90°05'57"	50.09'	N83°13'35"W	70.77'
	C2	7+24.71 TO 7+99.22	100.00'	74.51'	42°41'34"	39.08'	N59°31'24"W	72.80'
	C3	10+74.14 TO 10+96.11	50.00'	21.96'	25°10'07"	11.16'	S86°32'45"W	21.79'

CENTER CONTROL DATA			
	STATION	NORTHING	EASTING
NASHVILLE COURT	0+00.00	595454.05	1342470.28
	4+29.91	595187.74	1342132.79
	5+08.54	595196.09	1342062.51
	7+24.71	595366.02	1341928.90
	7+99.22	595402.94	1341866.16
	10+74.14	595446.57	1341594.71
	10+96.11	595445.26	1341572.97
	11+32.45	595435.22	1341538.04

LEGEND

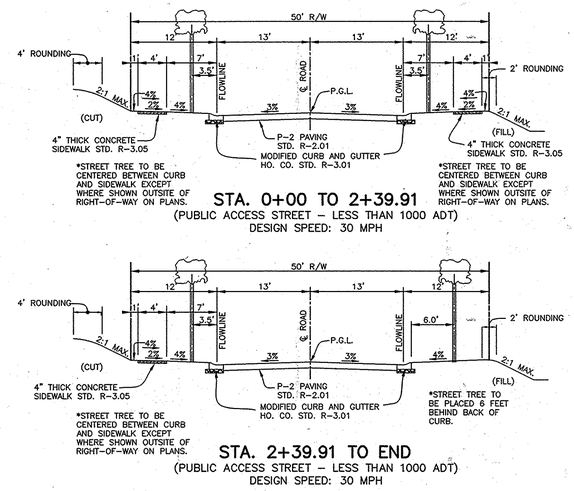
- EXISTING WETLANDS
- EXISTING STREAM
- EXISTING FLOODPLAIN
- PROPOSED ROAD PAVEMENT
- SIDEWALK

PUBLIC STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
✱	NASHVILLE COURT: 0+47.92 RIGHT	56-WATT (LED-100) COLONIAL POST-TOP FIXTURE MOUNTED ON A 14-FOOT BLACK FIBERGLASS POLE
	NASHVILLE COURT: 2+77.91 RIGHT	
	NASHVILLE COURT: 4+84 LEFT	
	NASHVILLE COURT: 7+00 LEFT	
	NASHVILLE COURT: 8+00 RIGHT	
	NASHVILLE COURT: 10+90 RIGHT	

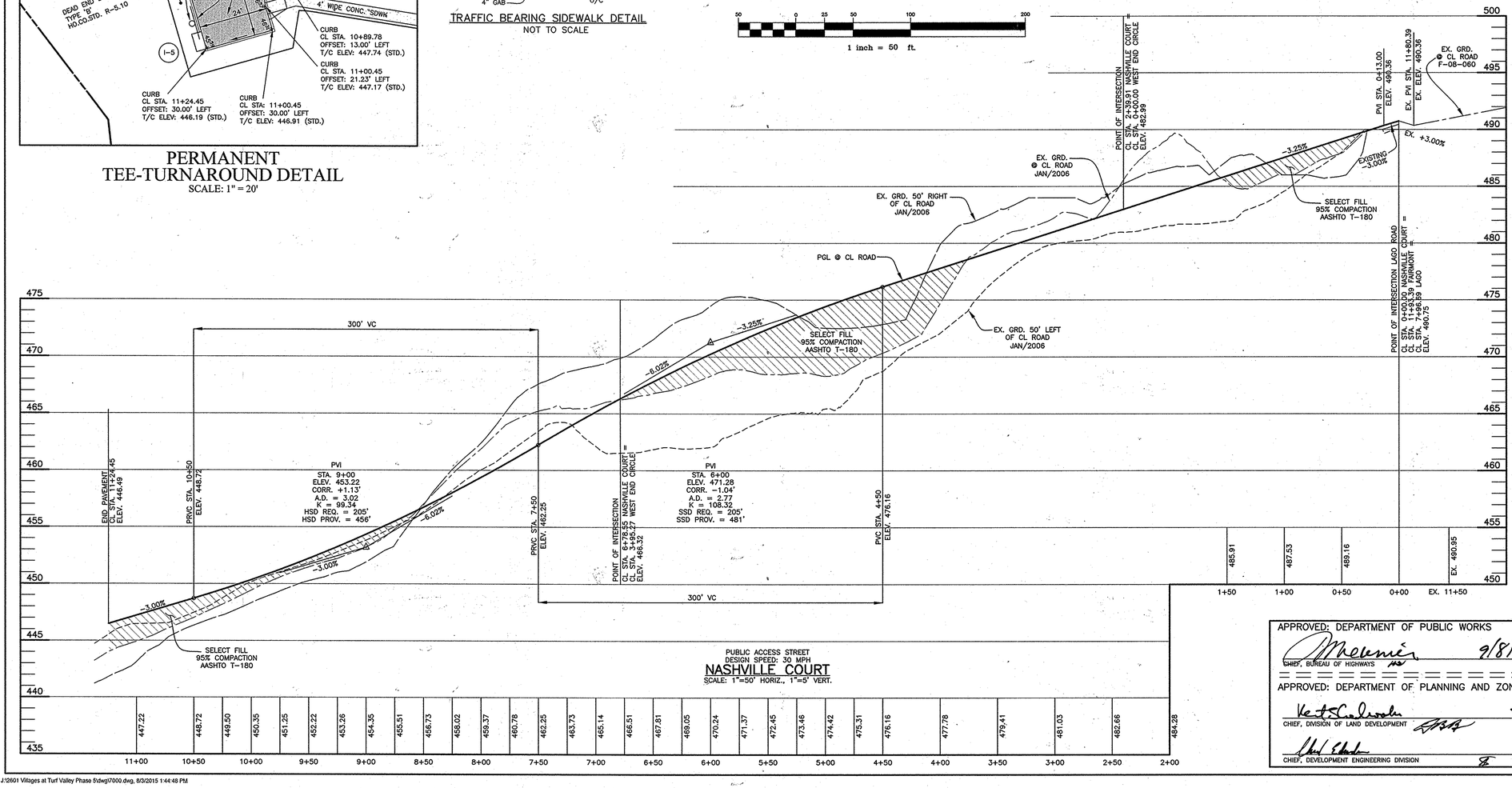
ROAD CHART				
ROAD	LIMITS	CLASSIFICATION	DESIGN SPEED	PVMT TYPE
NASHVILLE COURT	0+00 TO END	PUBLIC ACCESS STREET	30 MPH	P-2

PERMANENT TEE-TURNAROUND DETAIL
SCALE: 1" = 20'

TRAFFIC BEARING SIDEWALK DETAIL
NOT TO SCALE



DESIGN SPEED: 30 MPH
NASHVILLE COURT
TYPICAL ROADWAY CROSS-SECTIONS
SCALE: 1" = 10'



PUBLIC ACCESS STREET
DESIGN SPEED: 30 MPH
NASHVILLE COURT
SCALE: 1"=50' HORIZ., 1"=5' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 7-16-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 15675, Expiration Date: 6-30-2017.
STATE OF MARYLAND — CHRISTOPHER ALAN MASTERS — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

ROAD PLAN, PROFILES, DETAILS, SIGNAGE & STREET LIGHTING NASHVILLE COURT

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	SCALE: AS SHOWN	BEI PROJECT NO. 2601	SHEET 2 OF 18

F-15-079

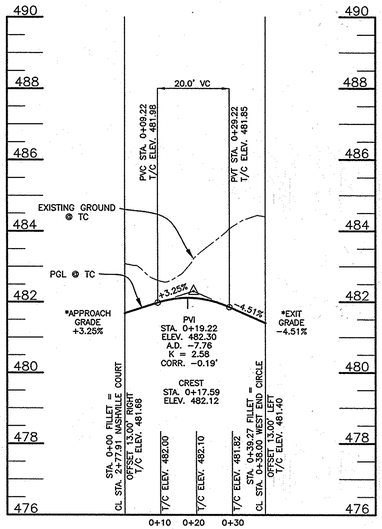
J:\2601 Villages at Turf Valley Phase 5\dwg\7000.dwg, 8/3/2015 1:44:48 PM

CENTER LINE CURVE DATA								
STREET NAME	CURVE	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD	
WEST END CIRCLE	C4	0+69.94 TO 3+05.30	150.00'	235.36'	89°54'03"	149.74'	N83°13'35"W	211.95'

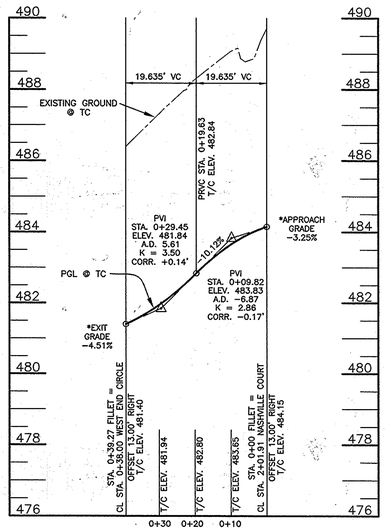
CENTER CONTROL DATA			
	STATION	NORTHING	EASTING
WEST END CIRCLE	0+00.00	595304.55	1342281.94
	0+69.94	595360.35	1342238.62
	3+05.30	595385.35	1342028.15
	3+95.27	595329.74	1341957.43

PUBLIC STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
✸	WEST END CIRCLE: 1+36 RIGHT WEST END CIRCLE: 2+72.50 RIGHT	56-WATT (LED-100) COLONIAL POST-TOP FIXTURE MOUNTED ON A 14-FOOT BLACK FIBERGLASS POLE

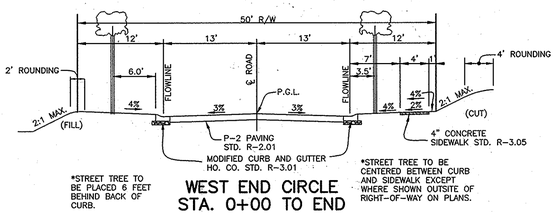
ROAD CHART				
ROAD	LIMITS	CLASSIFICATION	DESIGN SPEED	PVMT TYPE
WEST END CIRCLE	0+00 TO 3+95.27	PUBLIC ACCESS STREET	30 MPH	P-2



FILLET PROFILE
SOUTHWEST CORNER
NASHVILLE/WEST END STA. 0+00
SCALE: 1"=20' HORIZ., 1"=2' VERT.

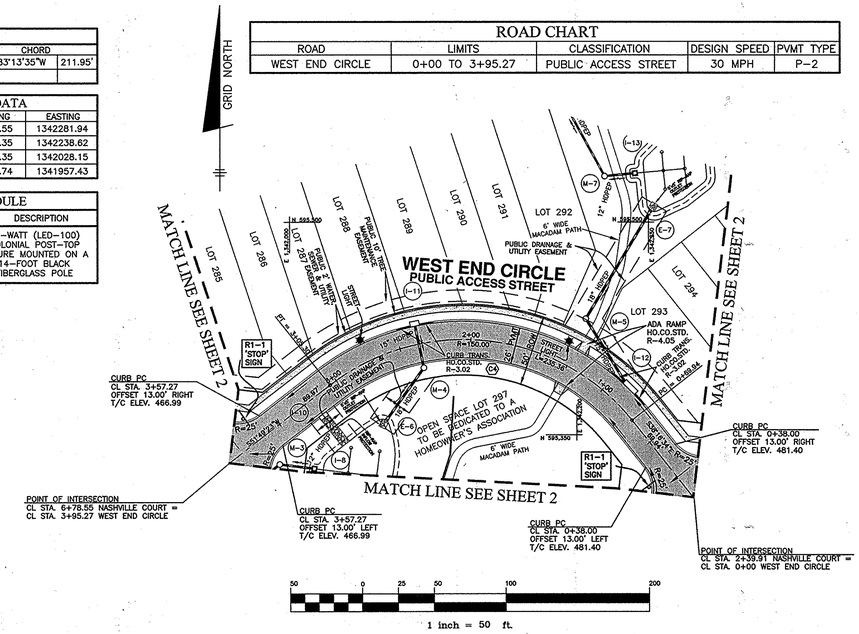


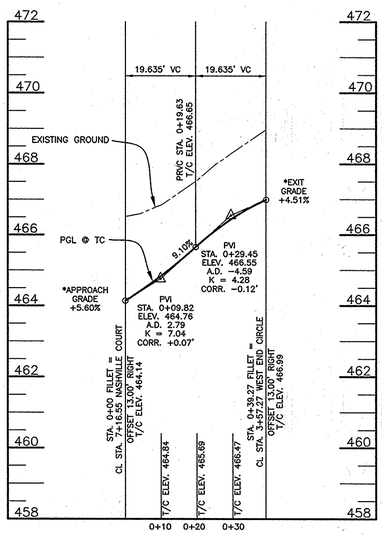
FILLET PROFILE
NORTHEAST CORNER
NASHVILLE/WEST END STA. 0+00
SCALE: 1"=20' HORIZ., 1"=2' VERT.



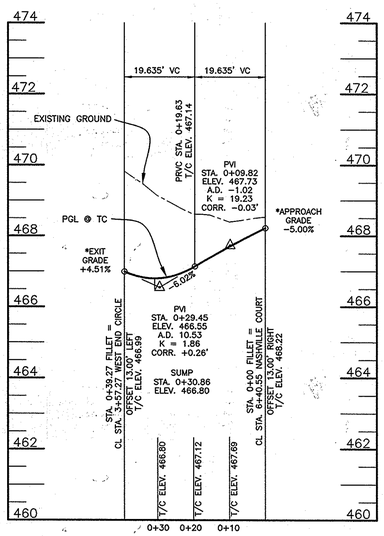
WEST END CIRCLE
STA. 0+00 TO END

TYPICAL ROADWAY SECTION
(PUBLIC ACCESS STREET – LESS THAN 1000 ADT)
DESIGN SPEED: 30 MPH
SCALE: 1" = 10'

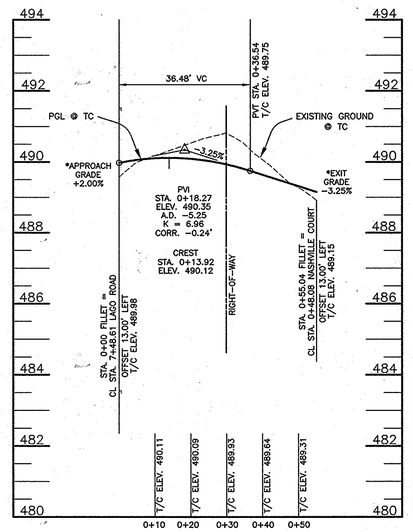




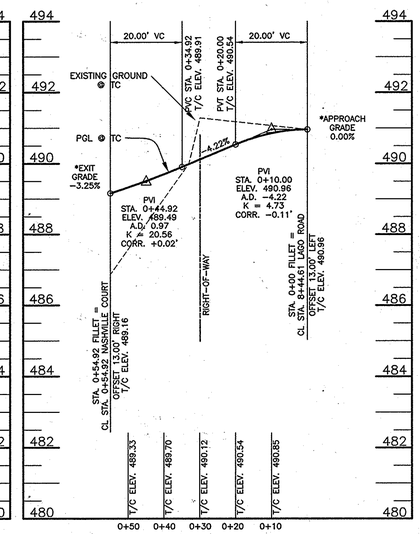
FILLET PROFILE
NORTH CORNER
NASHVILLE/WEST END STA. 3+95.27
SCALE: 1"=20' HORIZ., 1"=2' VERT.



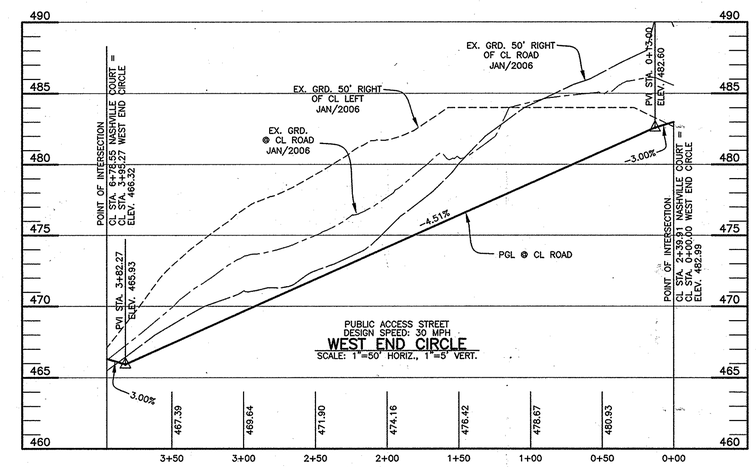
FILLET PROFILE
SOUTH CORNER
NASHVILLE/WEST END STA. 3+95.27
SCALE: 1"=20' HORIZ., 1"=2' VERT.

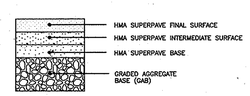


FILLET PROFILE
SOUTH CORNER
NASHVILLE COURT/LAGO ROAD
SCALE: 1"=20' HORIZ., 1"=2' VERT.



FILLET PROFILE
NORTH CORNER
NASHVILLE COURT/LAGO ROAD
SCALE: 1"=20' HORIZ., 1"=2' VERT.





SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE, 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0

P-2 PAVING DETAIL

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 15675, Expiration Date: 6-30-2017.

STATE OF MARYLAND — DAVID TOWER ALAN MAZLIN — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

ROAD PLAN, PROFILE, DETAILS, SIGNAGE AND STREET LIGHTING WEST END CIRCLE

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 3 OF 18

F-15-079

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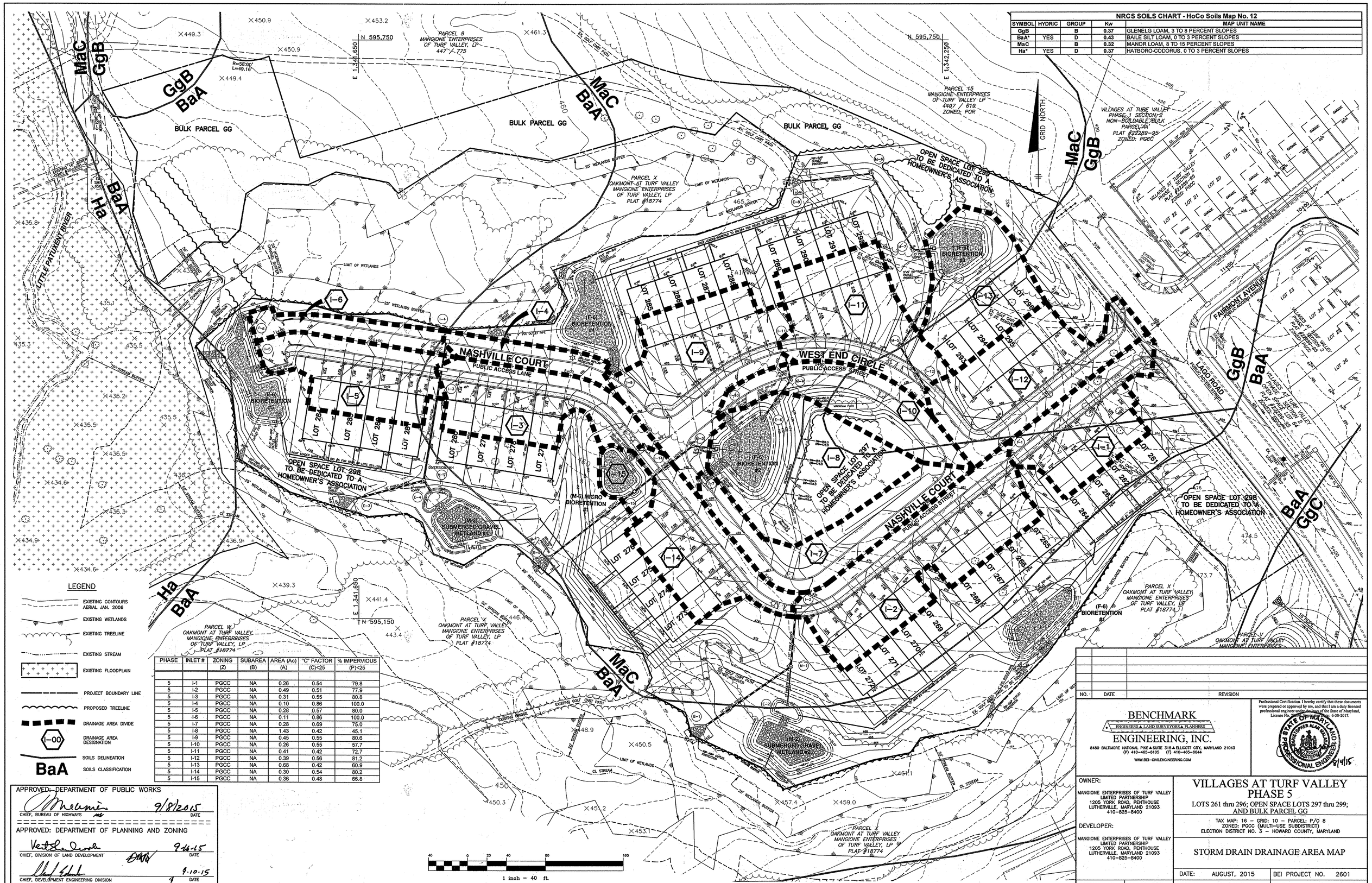
NRCS SOILS CHART - HoCo Soils Map No. 12				
SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GgB		B	0.37	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
BaA*	YES	D	0.43	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES
MaC		B	0.32	MANOR LOAM, 8 TO 15 PERCENT SLOPES
Ha*	YES	D	0.37	HATBORO-CODORUS, 0 TO 3 PERCENT SLOPES



LEGEND

- EXISTING CONTOURS
- AERIAL JAN. 2006
- EXISTING WETLANDS
- EXISTING TREELINE
- EXISTING STREAM
- EXISTING FLOODPLAIN
- PROJECT BOUNDARY LINE
- PROPOSED TREELINE
- DRAINAGE AREA DIVIDE
- I-00 DRAINAGE AREA DESIGNATION
- BaA SOILS DELINEATION
- BaA SOILS CLASSIFICATION

PHASE	INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
5	I-1	PGCC	NA	0.26	0.54	79.8
5	I-2	PGCC	NA	0.49	0.51	77.9
5	I-3	PGCC	NA	0.31	0.55	80.8
5	I-4	PGCC	NA	0.10	0.88	100.0
5	I-5	PGCC	NA	0.28	0.57	80.0
5	I-6	PGCC	NA	0.11	0.86	100.0
5	I-7	PGCC	NA	0.28	0.69	75.0
5	I-8	PGCC	NA	1.43	0.42	45.1
5	I-9	PGCC	NA	0.45	0.55	80.6
5	I-10	PGCC	NA	0.26	0.55	57.7
5	I-11	PGCC	NA	0.41	0.42	72.7
5	I-12	PGCC	NA	0.39	0.56	81.2
5	I-13	PGCC	NA	0.68	0.42	60.9
5	I-14	PGCC	NA	0.30	0.54	80.2
5	I-15	PGCC	NA	0.36	0.48	66.8

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-10-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

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WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 32706, Expiration Date: 6-30-2017.

STATE OF MARYLAND — DAVID TIMOTHY KAUFFMAN — No. 32706 — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORM DRAIN DRAINAGE AREA MAP

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 4 OF 18

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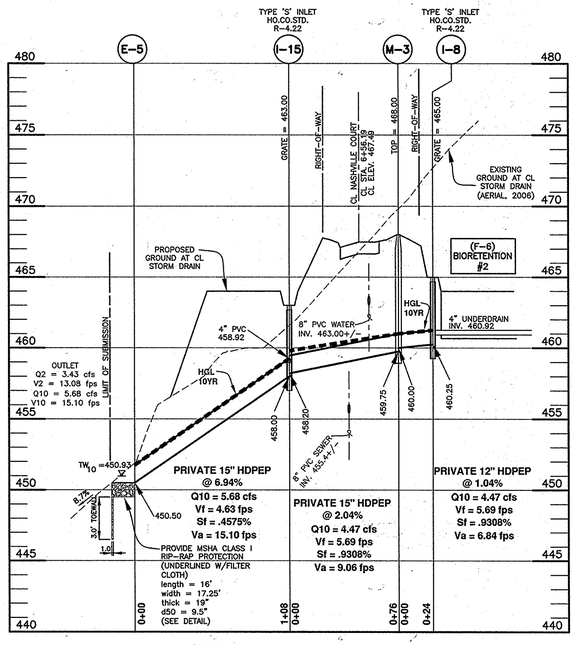
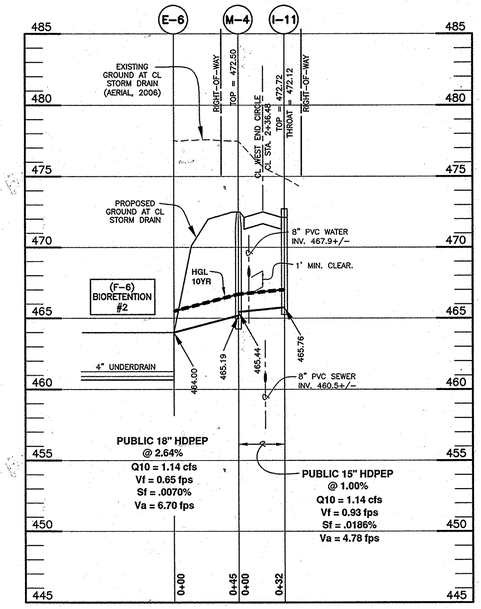


STORM DRAIN PROFILE
SCALE: 1" = 50' HORZ., 1" = 5' VERT.



STORM DRAIN PROFILE
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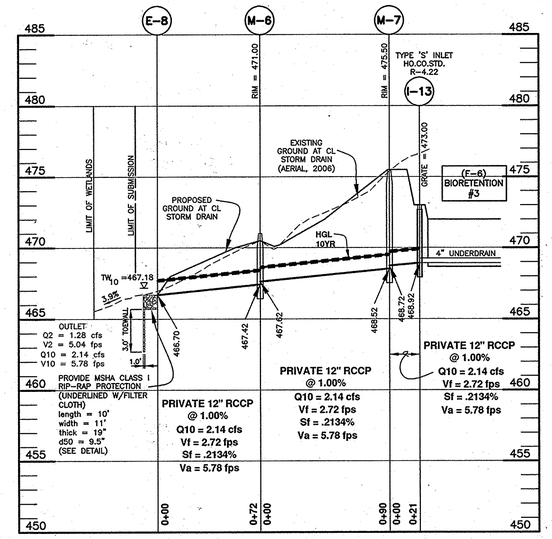

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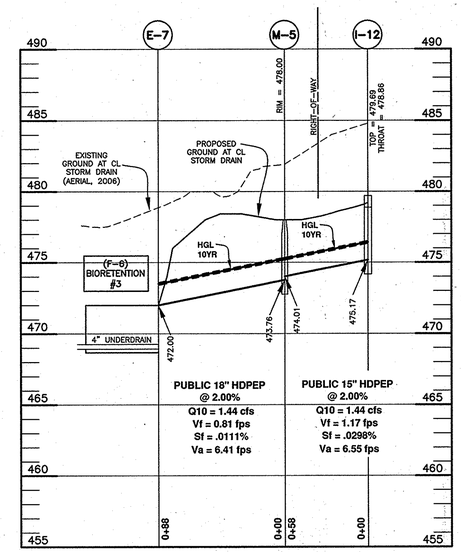

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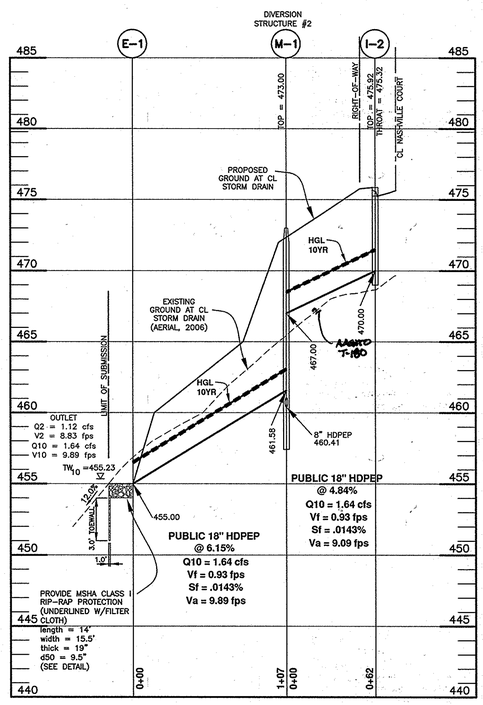

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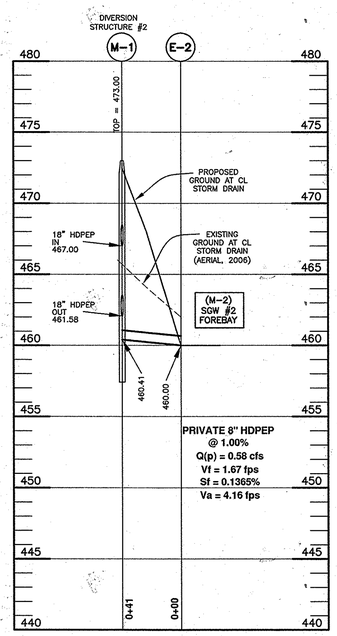

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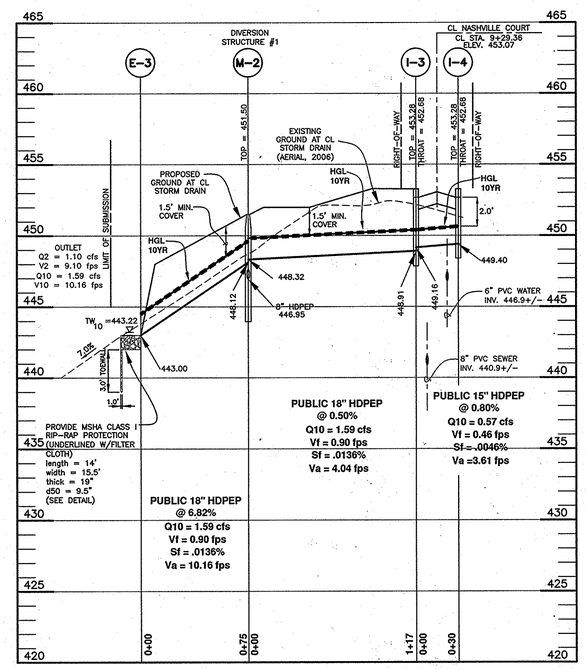

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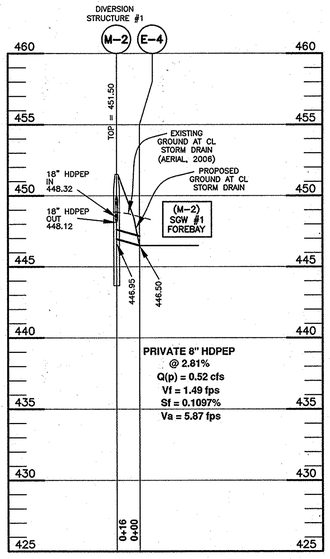

STORM DRAIN PROFILE
SCALE: 1" = 50' HORZ., 1" = 5' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 20997, Expiration Date: 6-30-2017.

STATE OF MARYLAND — PROFESSIONAL ENGINEER — 8/4/15

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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORM DRAIN PROFILES

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 5 OF 18

F-15-079

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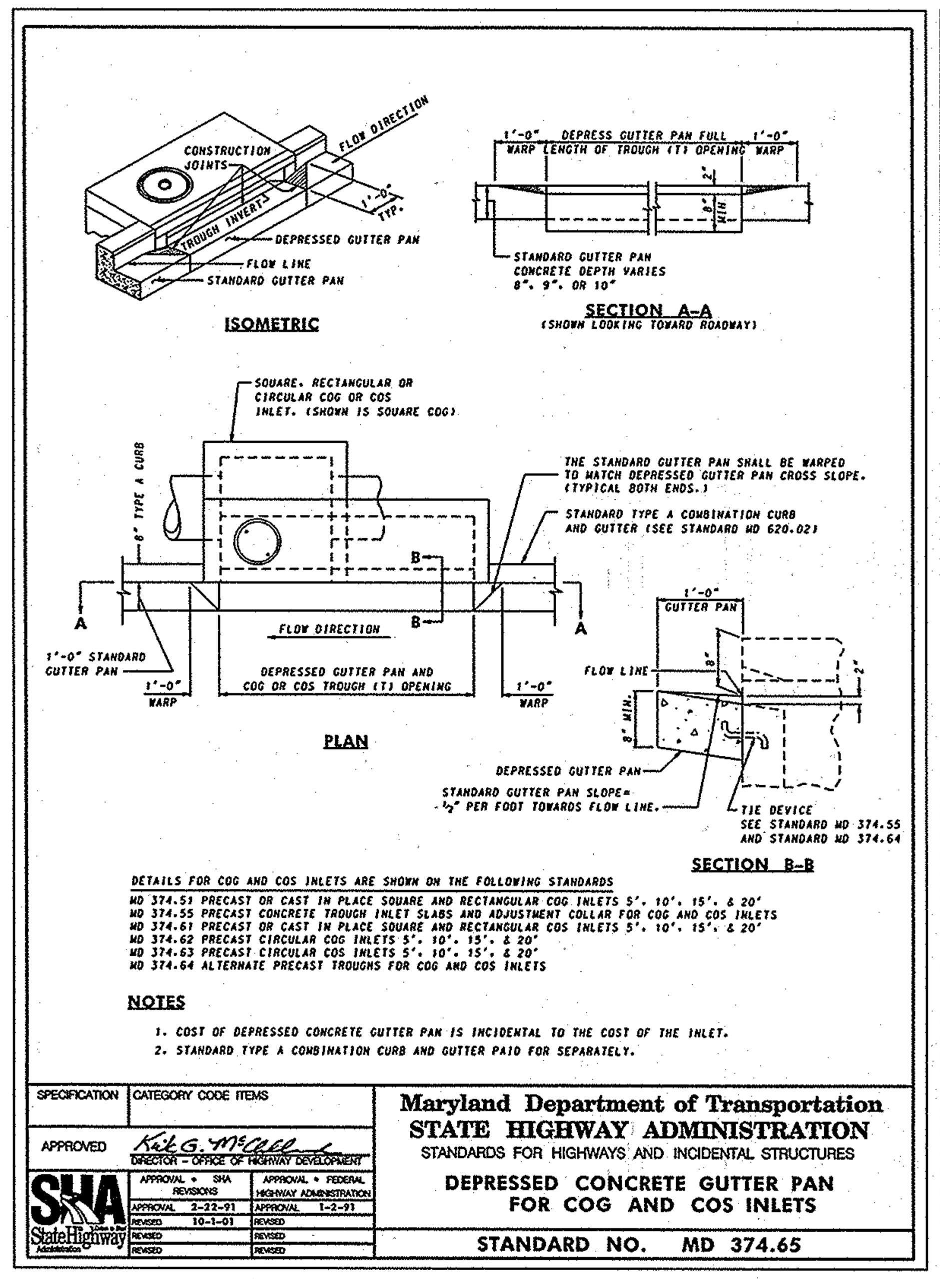
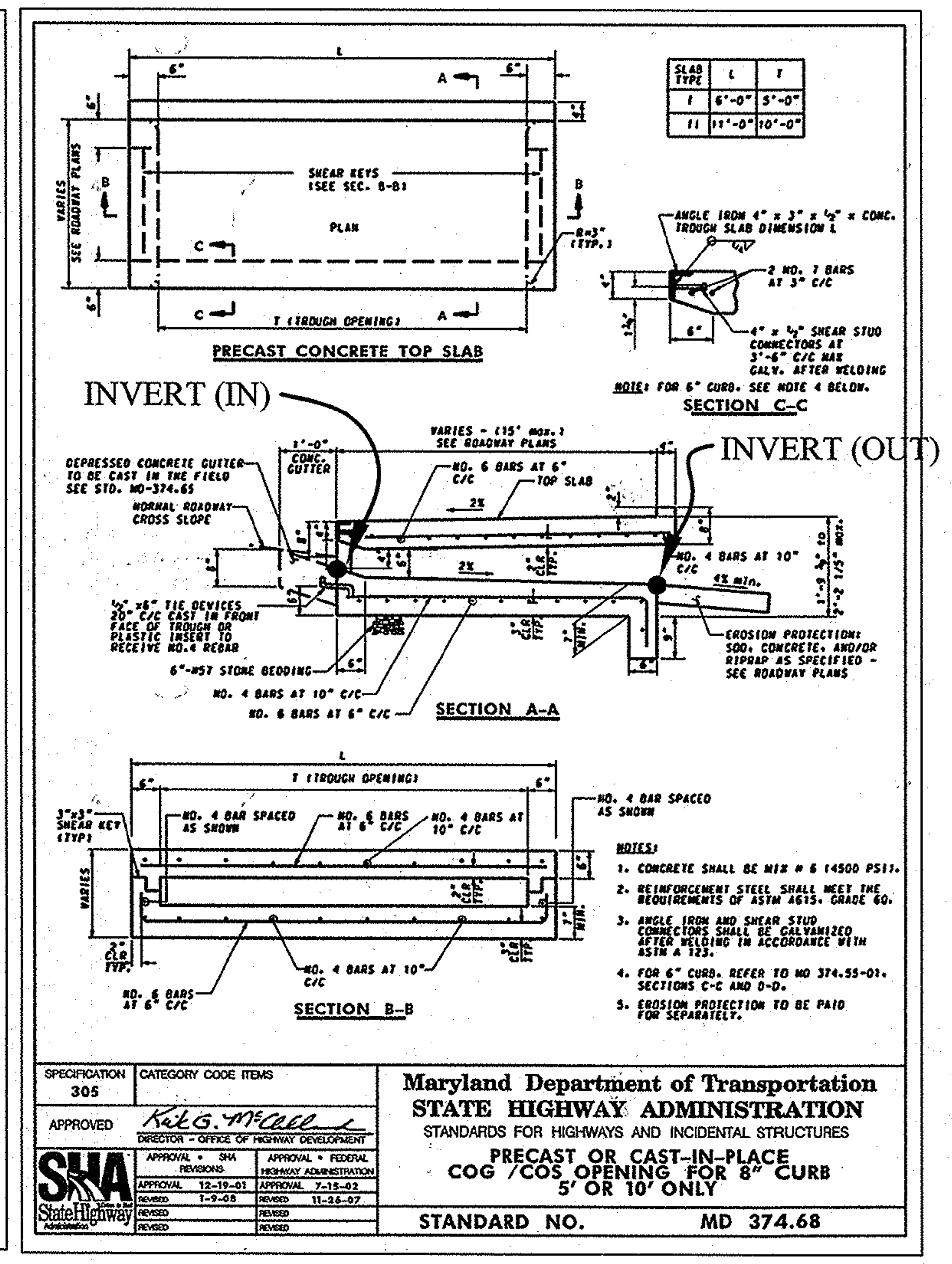




TYPICAL FLOW-THRU INLET DETAIL
NOT TO SCALE

STRUCTURE TABLE

NUMBER	TYPE	LOCATION	INVERT IN **		INVERT OUT		TOP ELEV.	THROAT ELEV.	STD. DETAIL	INLET WIDTH	MAINTENANCE
INLETS											
I-1	Flow-thru A-5	CL STA. 2+01.87 NASHVILLE COURT, OFFSET 13.00' LEFT	483.66	-	483.28		484.43	483.83	SHA MD 374-68	11.0'	PUBLIC
I-2	A-5	CL STA. 4+65.49 NASHVILLE COURT, OFFSET 13.00' LEFT	-	-	470.00 (18")		475.92	475.32	HO.CO.STD. D-4.01	3.0'	PUBLIC
I-3	A-10	CL STA. 9+40.58 NASHVILLE COURT, OFFSET 13.00' LEFT	449.16 (15")	-	448.91 (18")		453.28	452.68	HO.CO.STD. D-4.03	3.0'	PUBLIC
I-4	A-5	CL STA. 9+40.58 NASHVILLE COURT, OFFSET 13.00' RIGHT	-	-	449.40 (15")		453.28	452.68	HO.CO.STD. D-4.01	3.0'	PUBLIC
I-5	Flow-thru A-5	CL STA. 11+24.45 NASHVILLE COURT, OFFSET 26.83' LEFT	445.42	-	445.20		446.19	445.59	SHA MD 374-68	3.0'	PUBLIC
I-6	Flow-thru A-5	CL STA. 11+24.45 NASHVILLE COURT, OFFSET 26.83' RIGHT	445.42	-	445.20		446.19	445.59	SHA MD 374-68	3.0'	PUBLIC
I-7	Flow-thru A-10	CL STA. 6+22.88 NASHVILLE COURT, OFFSET 13.00' RIGHT	468.60	-	468.38		469.37	468.77	SHA MD 374-68	3.0'	PUBLIC
I-8	S	N 595326.41 E 1342017.25	460.92 (4")	-	460.25 (12")		465.83	465.00	HO.CO.STD.D-4.22	NA	PRIVATE
I-9	Flow-thru A-10	CL STA. 7+62.91 NASHVILLE COURT, OFFSET 13.00' RIGHT	460.93	-	460.71		461.70	461.10	SHA MD 374-68	3.0'	PUBLIC
I-10	Flow-thru A-5	CL STA. 3+22.35 WEST END CIRCLE, OFFSET 13.00' LEFT	468.07	-	467.85		468.84	468.24	SHA MD 374-68	3.0'	PUBLIC
I-11	A-5	CL STA. 2+36.48 WEST END CIRCLE, OFFSET 13.00' RIGHT	-	-	465.76 (15")		472.72	472.12	HO.CO.STD. D-4.01	3.0'	PUBLIC
I-12	A-10	CL STA. 0+87.36 WEST END CIRCLE, OFFSET 13.00' RIGHT	-	-	475.17 (15")		479.69	478.86	HO.CO.STD. D-4.03	3.0'	PUBLIC
I-13	S	N 595534.21 E 1342240.80	468.92 (4")	-	468.92 (12")		473.00	NA	HO.CO.STD. D-4.22	NA	PRIVATE
I-14	Flow-thru A-5	CL STA. 6+86.16 NASHVILLE COURT, OFFSET 13.00' LEFT	465.52		465.14		466.12	465.52	SHA MD 374-68	11.0'	PUBLIC
I-15	S	N 595282.19 E 1341933.12	458.20 (15")	458.92 (4")	458.00		463.00	NA	HO.CO.STD. D-4.22	NA	PRIVATE
Note: Invert IN for flow-thru inlets refers to the gutter pan elevation at throat											
MANHOLES											
M-1	4' DIA	N 595100.63 E 1342093.72	467.00 (18")	-	461.08 (18")	460.41 (8")	473.00		HO.CO.STD. G-5.12		PRIVATE
M-2	4' DIA	N 595293.27 E 1341716.72	448.32 (18")	-	448.12 (18")	446.95 (8")	451.50		HO.CO.STD. G-5.12		PRIVATE
M-3	4' DIA	CL STA. 6+56.19 NASHVILLE COURT, OFFSET 27.84' RIGHT	460.00 (12")	-	459.75 (15")	NA	468.00		HO.CO.STD. G-5.12		PRIVATE
M-4	4' DIA	CL STA. 2+36.48 WEST END CIRCLE, OFFSET 17.10' LEFT	465.44 (15")	-	465.19 (18")	NA	472.50		HO.CO.STD. G-5.12		PUBLIC
M-5	4' DIA	CL STA. 1+33.54 WEST END CIRCLE, OFFSET 35.59' RIGHT	474.01 (15")	-	473.76 (18")	NA	478.00		HO.CO.STD. G-5.12		PUBLIC
M-6	4' DIA	N 595611.57 E 1342176.62	467.62 (12")	-	467.42 (12")	NA	471.00		HO.CO.STD. G-5.12		PRIVATE
M-7	4' DIA	N 595532.22 E 1342219.54	468.72 (12")	-	468.52 (12")	NA	475.50		HO.CO.STD. G-5.12		PRIVATE
END SECTIONS											
E-1	18" HDPEP	N 595039.39 E 1342006.45	-	-	455.00	-			NA		PUBLIC
E-2	8" HDPEP	N 595060.05 E 1342090.20	-	-	460.00	-			NA		PRIVATE
E-3	18" HDPEP	N 595273.58 E 1341644.32	-	-	443.00	-			NA		PUBLIC
E-4	8" HDPEP	N 595279.83 E 1341725.04	-	-	446.50	-			NA		PRIVATE
E-5	15" HDPEP	N 595215.33 E 1341848.09	-	-	450.50	-			NA		PRIVATE
E-6	18" HDPEP	N 595360.35 E 1342067.23	-	-	464.00	-			NA		PUBLIC
E-7	18" HDPEP	N 595508.35 E 1342251.62	-	-	472.00	-			NA		PUBLIC
E-8	12" HDPEP	N 595603.57 E 1342105.49	-	-	466.70	-			NA		PRIVATE

STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE RIM.
STRUCTURE LOCATION FOR A-5, A-10 AND FLOW-THRU INLETS IS AT THE CENTER OF THE INLET FACE.
STRUCTURE LOCATION FOR TYPE 'D' AND 'S' INLETS IS AT THE CENTER OF TOP OF INLET OF GRATE.
STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE MIDPOINT OF THE END OF THE STRUCTURE.
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
4"	PVC (MB OUTALLS) (NON PERFORATED)	189	PRIVATE
8"	HDPEP	57	PRIVATE
12"	HDPEP	207	PRIVATE
15"	HDPEP	184	PRIVATE
15"	HDPEP	120	PUBLIC
18"	HDPEP	494	PUBLIC

All pipes shall have smooth interior. No interior corrugations.

CONSTRUCTION SPECIFICATIONS

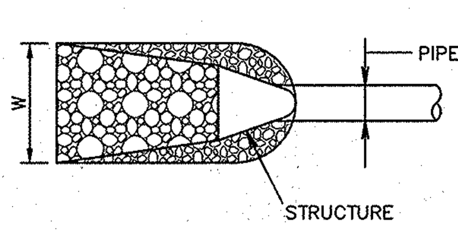
1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.

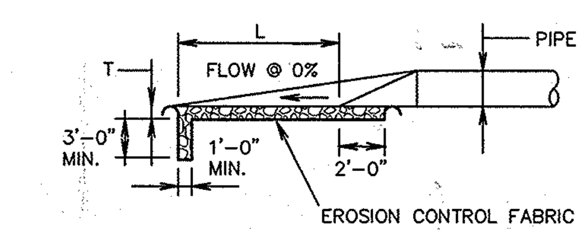
3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.

4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR HE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.

5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



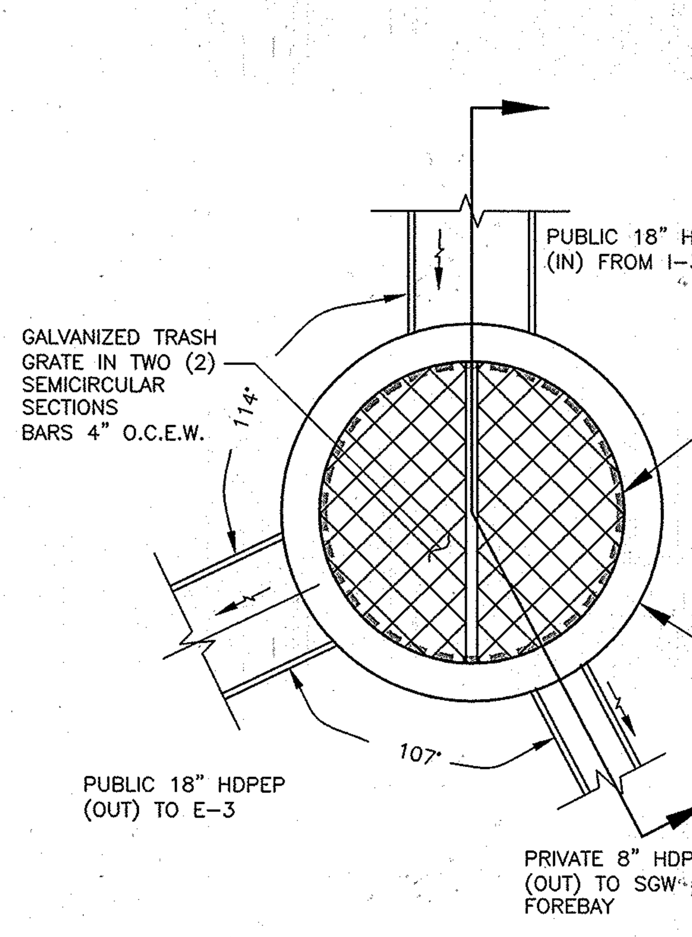
PLAN



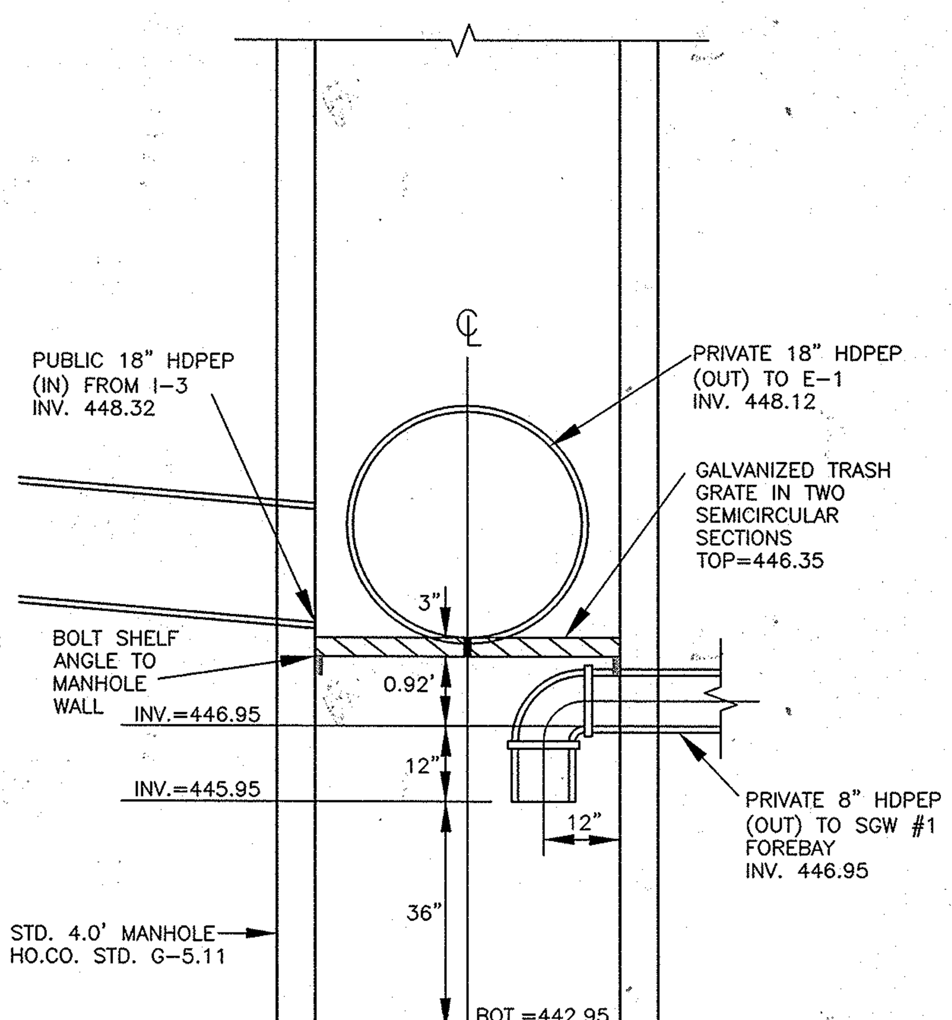
SECTION

STRUCTURE	V10 fps	d10 (ft)	d50	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
E-1	9.89	0.23	9.5"	14'	15.5'	19"	I
E-2	NA		9.5"	FOREBAY		19"	I
E-3	10.16	0.22	9.5"	14'	15.5'	19"	I
E-4	NA		9.5"	FOREBAY		19"	I
E-5	15.10	0.43	9.5"	14'	15'	19"	I
E-6	6.70	0.23	9.5"	5'	5'	19"	I
E-7	6.41	0.28	9.5"	5'	5'	19"	I
E-8	5.78	0.48	9.5"	10'	11'	19"	I

OUTLET PROTECTION DETAIL
NOT TO SCALE



PLAN VIEW



SECTION VIEW

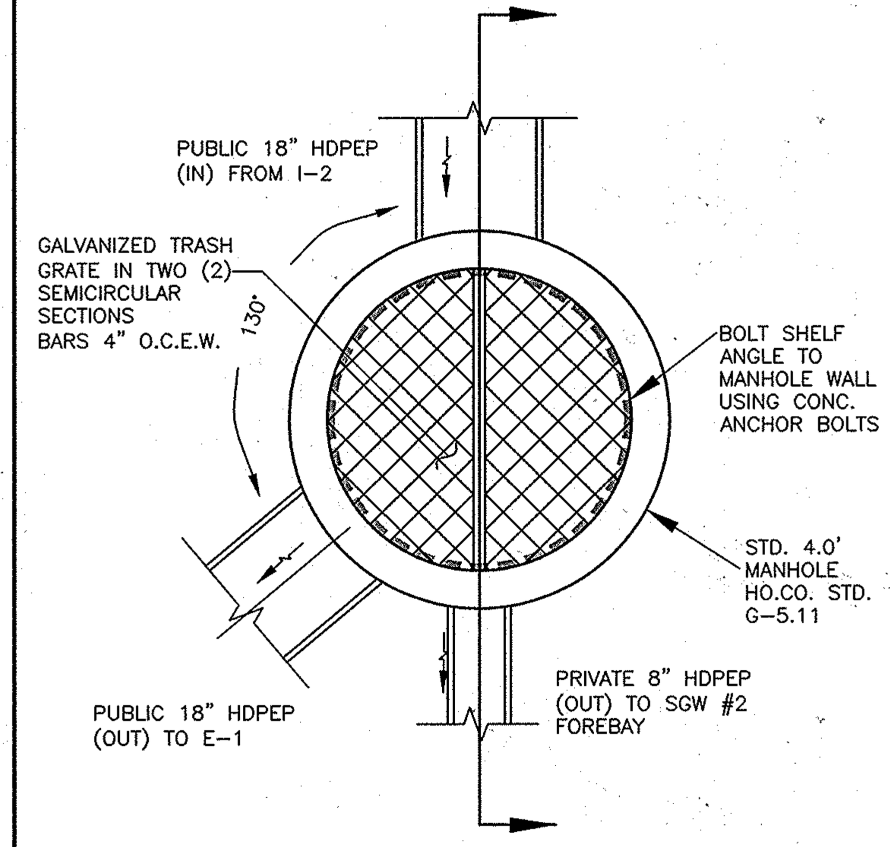
NOTES:

1. THIS STRUCTURE COMFORMS TO MDE APPENDIX D-8, DETAIL 6 AND HO. CO. STD. DETAIL G-5.11

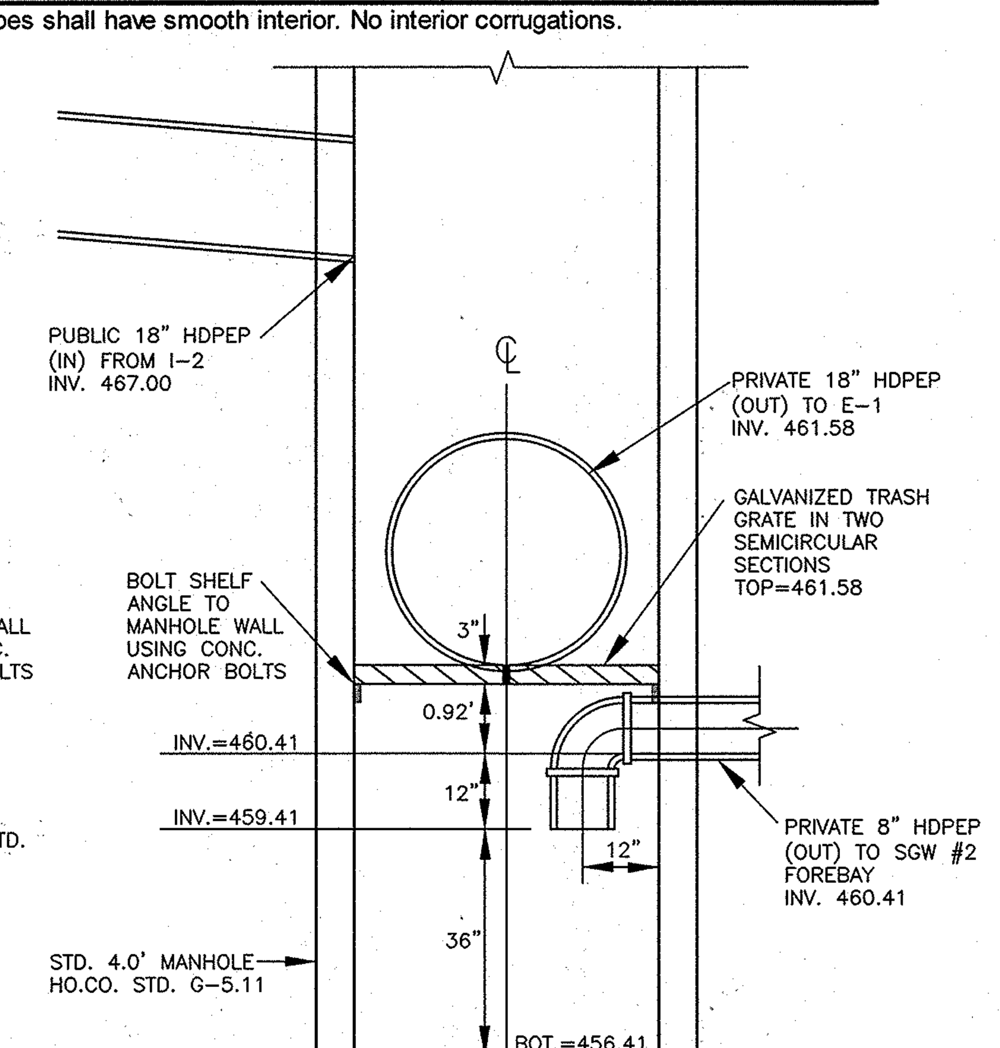
2. DIVERSION STRUCTURE SHALL BE PRIVATELY OWNED AND MAINTAINED.

DIVERSION STRUCTURE #1 (M-2)

SCALE: 1" = 2'



PLAN VIEW



SECTION VIEW

NOTES:

1. THIS STRUCTURE COMFORMS TO MDE APPENDIX D-8, DETAIL 6 AND HO. CO. STD. DETAIL G-5.11

2. DIVERSION STRUCTURE SHALL BE PRIVATELY OWNED AND MAINTAINED.

DIVERSION STRUCTURE #2 (M-1)

SCALE: 1" = 2'

APPROVED: DEPARTMENT OF PUBLIC WORKS
[signature] 9/8/2015
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[signature] 9-16-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE
[signature] 9.10.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22190 Expiration Date: 6-30-2017.
[seal and signature] 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

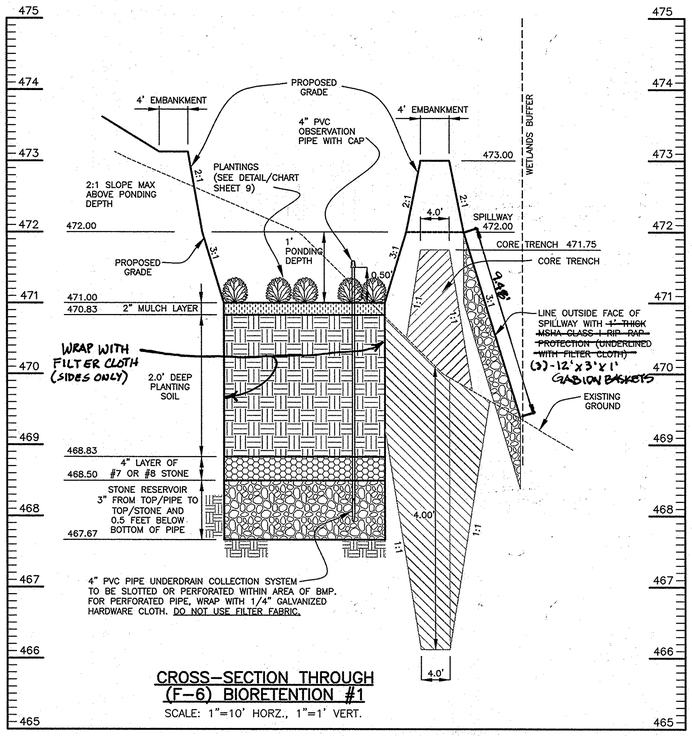
TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORM DRAIN DETAILS

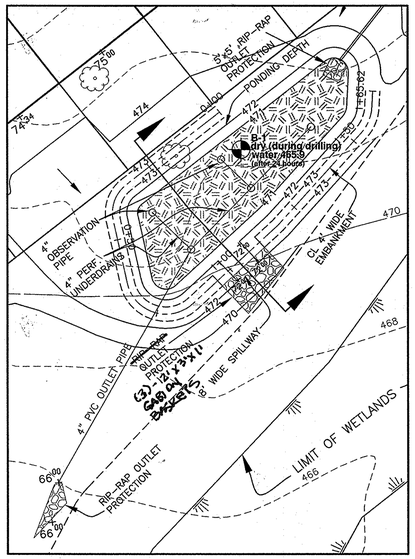
DATE: AUGUST, 2015 | BEI PROJECT NO. 2601
DESIGN: DBT | DRAFT: DBT | SCALE: AS SHOWN | SHEET 6 OF 18

F-15-079

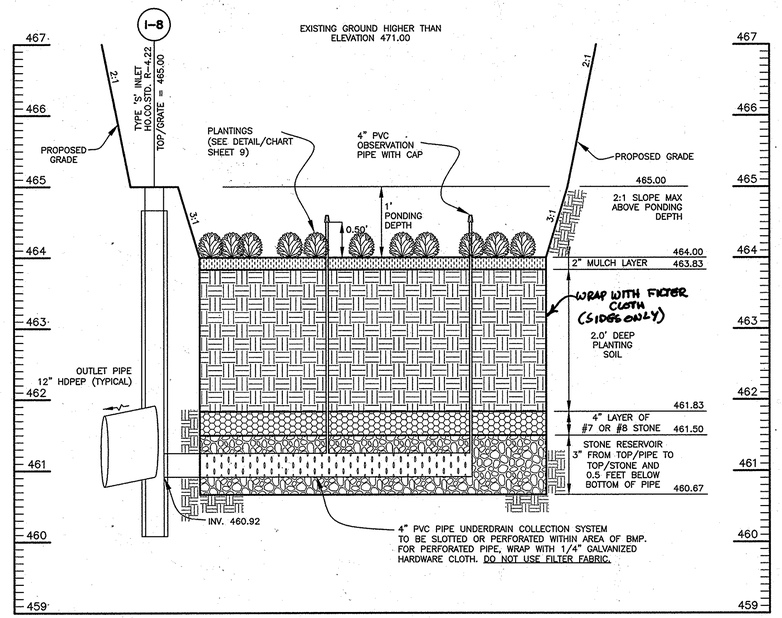
J:\2601 Villages at Turf Valley Phase 5\dwg\7044.dwg, 8/3/2015 2:00:58 PM



CROSS-SECTION THROUGH
(F-6) BIORETENTION #1
SCALE: 1"=10' HORZ., 1"=1' VERT.



PLAN VIEW
(F-6) BIORETENTION FACILITY #1
SCALE: 1"=20'



CROSS-SECTION THROUGH
(F-6) BIORETENTION #2
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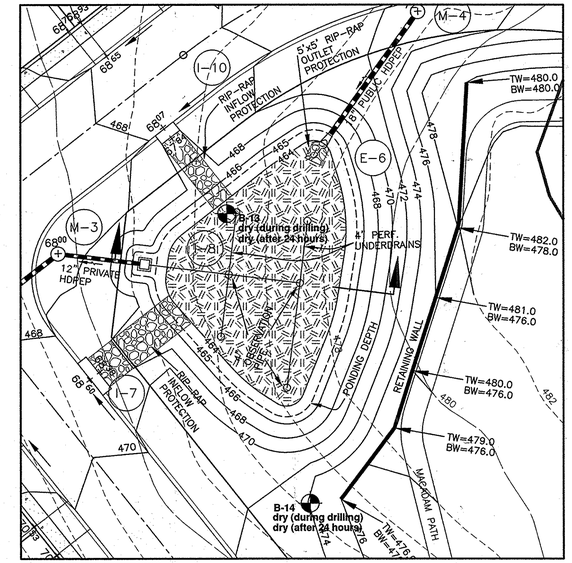
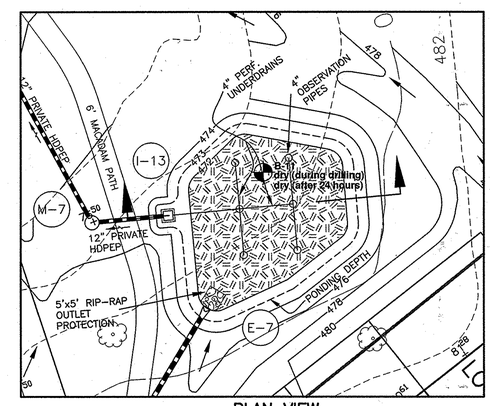
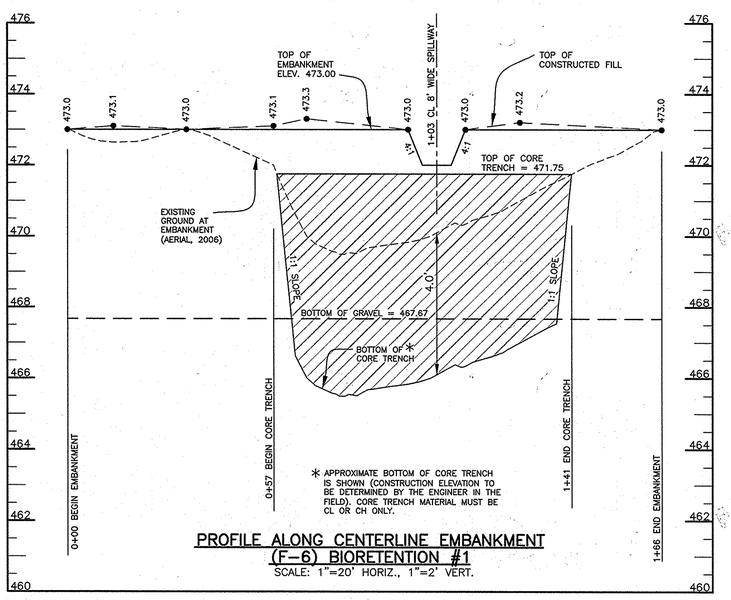


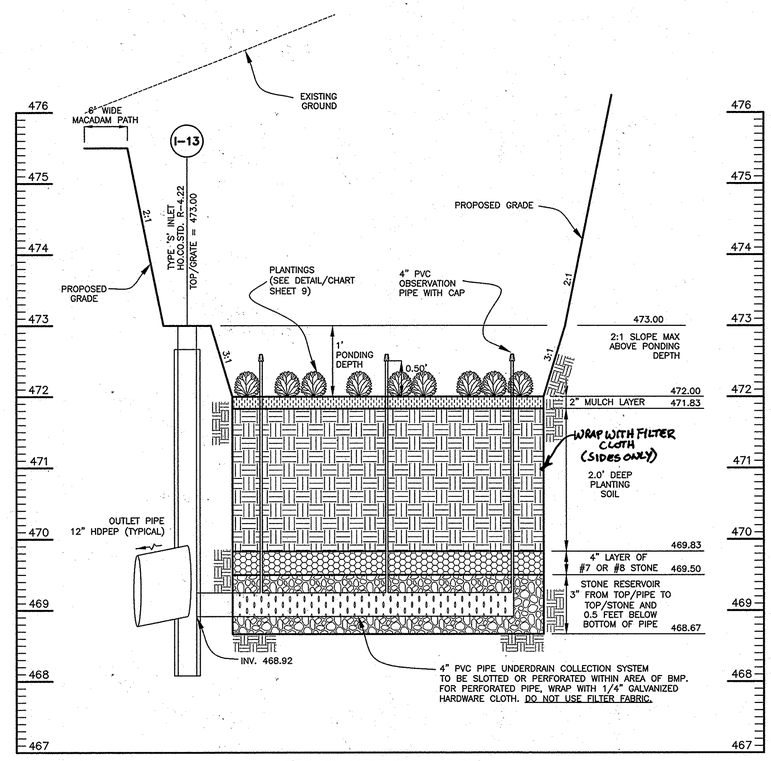
PLAN VIEW
(F-6) BIORETENTION FACILITY #2
SCALE: 1"=20'



PLAN VIEW
(F-6) BIORETENTION FACILITY #3
SCALE: 1"=20'



PROFILE ALONG CENTERLINE EMBANKMENT
(F-6) BIORETENTION #1
SCALE: 1"=20' HORIZ., 1"=2' VERT.



CROSS-SECTION THROUGH
(F-6) BIORETENTION #3
SCALE: 1"=10' HORZ., 1"=1' VERT.

**F-6 BIORETENTION FACILITIES WILL NOT BE REVIEWED AGAINST MD-378 CRITERIA **

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

BENCHMARK
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ENGINEERING, INC.
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(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. [illegible] Expiration Date: 6-30-2017.

STATE OF MARYLAND — PROFESSIONAL ENGINEER — 8/7/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
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LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
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1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

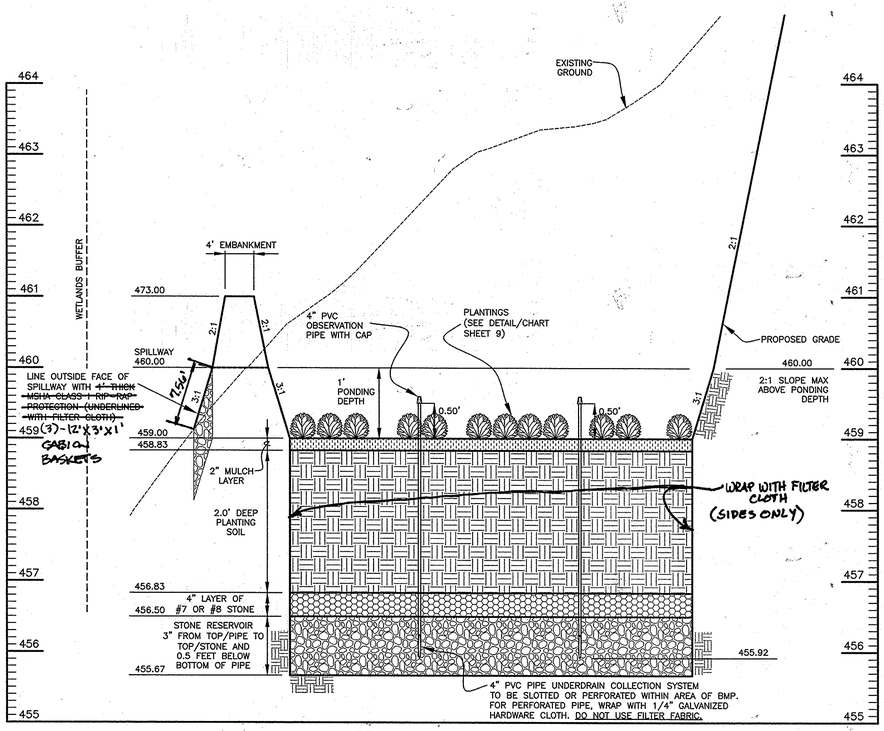
TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS (F-6) BIORETENTION FACILITIES

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 7 OF 18

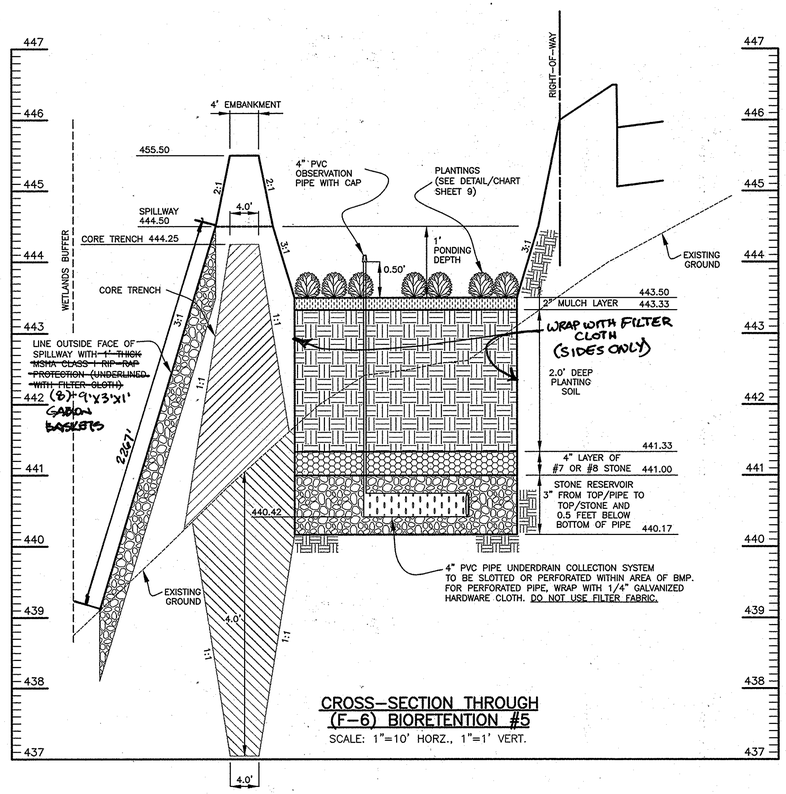
F-15-079

J:\2601 Villages at Turf Valley Phase 5\dwg\7044.dwg, 8/3/2015 2:03:25 PM



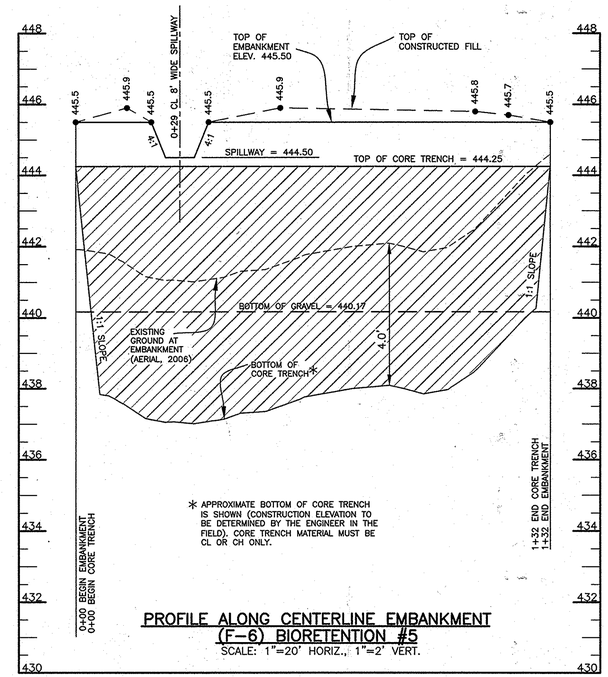
CROSS-SECTION THROUGH (F-6) BIORETENTION #4

SCALE: 1"=10' HORZ., 1"=1' VERT.



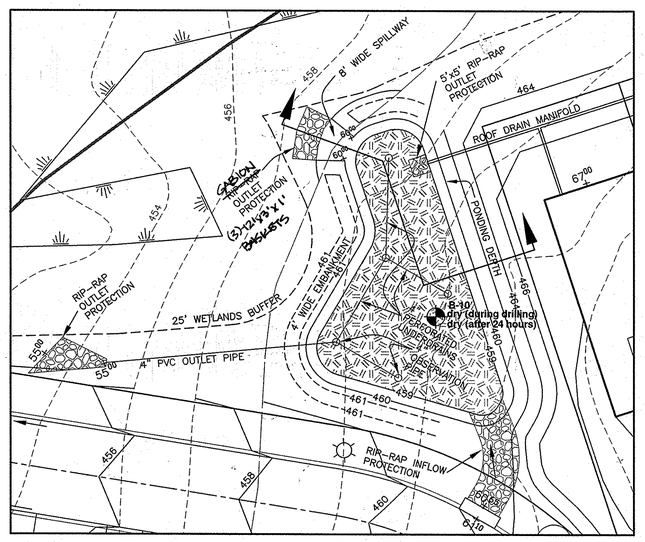
CROSS-SECTION THROUGH (F-6) BIORETENTION #5

SCALE: 1"=10' HORZ., 1"=1' VERT.



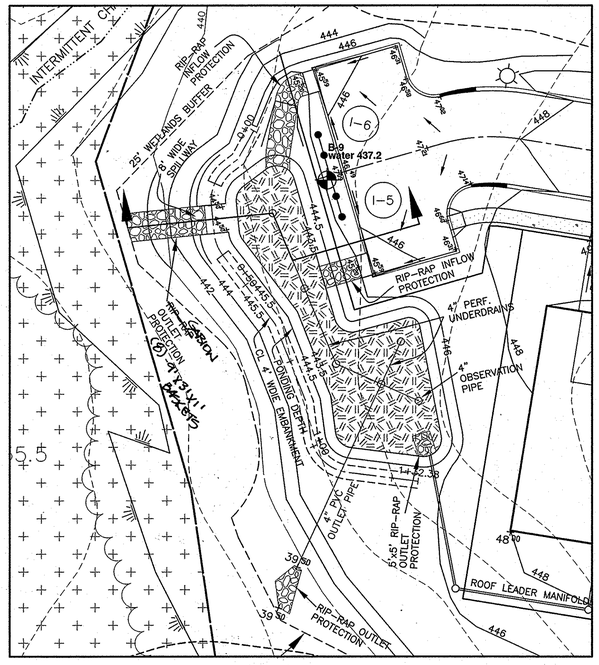
PROFILE ALONG CENTERLINE EMBANKMENT (F-6) BIORETENTION #5

SCALE: 1"=20' HORZ., 1"=2' VERT.



PLAN VIEW (F-6) BIORETENTION FACILITY #4

SCALE: 1"=20'



PLAN VIEW (F-6) BIORETENTION FACILITY #5

SCALE: 1"=20'

**F-6 BIORETENTION FACILITIES WILL NOT BE REVIEWED AGAINST MD-378 CRITERIA **

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9.10.15

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification, I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 24044, Expiration Date: 6-30-2017.

STATE OF MARYLAND — DAVID T. BUCHANAN — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS (F-6) BIORETENTION FACILITIES

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 8 OF 18

F-15-079

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CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretention. Rain Gardens, Landscape Infiltration & Infiltration Berms

1. Material Specifications:

The allowable materials to be used in these practices are detailed in Table B.4.1.

2. Filtering Media or Planting Soil:

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretention practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:

Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy and(60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).
Clay Content - Media shall have a clay content of less than 5%.
pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

3. Compaction:

It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoes to remove original soil. If practices are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material:

Recommended plant material for micro-bioretention practices can be found in Appendix A, Section A.2.3.

5. Plant Installation:

Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

6. Underdrains:

Underdrains should meet the following criteria:

- Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
- Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (No. 4 or 4x4) galvanized hardware cloth.
- Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (⅛" to ⅜" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous:

These practices may not be constructed until all contributing drainage area has been stabilized

OPERATION AND MAINTENANCE SCHEDULE FOR
LANDSCAPE INFILTRATION **(M-3)** MICRO-BIORETENTION **(M-6)**,
RAIN GARDENS **(M-7)**, BIORETENTION SWALE **(M-8)**,
ENHANCED FILTERS **(M-9)**

a. The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.

b. The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.

c. The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.

d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

OPERATION AND MAINTENANCE SCHEDULE FOR
BIORETENTION FACILITY **(F-6)**

a. The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.

b. The Owner shall perform a plant inspection in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.

c. The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed the new layer is applied.

d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

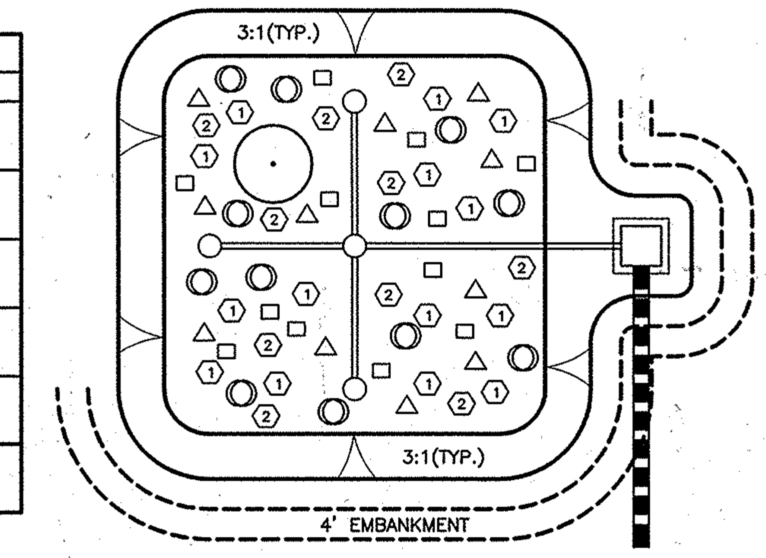
Appendix B.4. Construction Specifications for Environmental Site Design Practices

Table B.4.1. Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
Planting soil [2' to 4' deep]	loamy sand (60 - 65%) & compost (35 – 40%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, minimum; no pine or wood chips
Pea gravel diaphragm	pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobbles	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (3/8" to 3/4")	
Underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes. Perforated pipe shall be wrapped with ¼-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

PLANTING LEGEND

SYMBOL	NAME
① (hexagon)	LOBELIA CARDINALIS
② (hexagon)	LOBELIA SIPHILITICA
□	CAREX STRICTA
△	IRIS VERSICOLOR
◎	LIATRIS SPICATA
⊙	ILEX VERTICILLATA

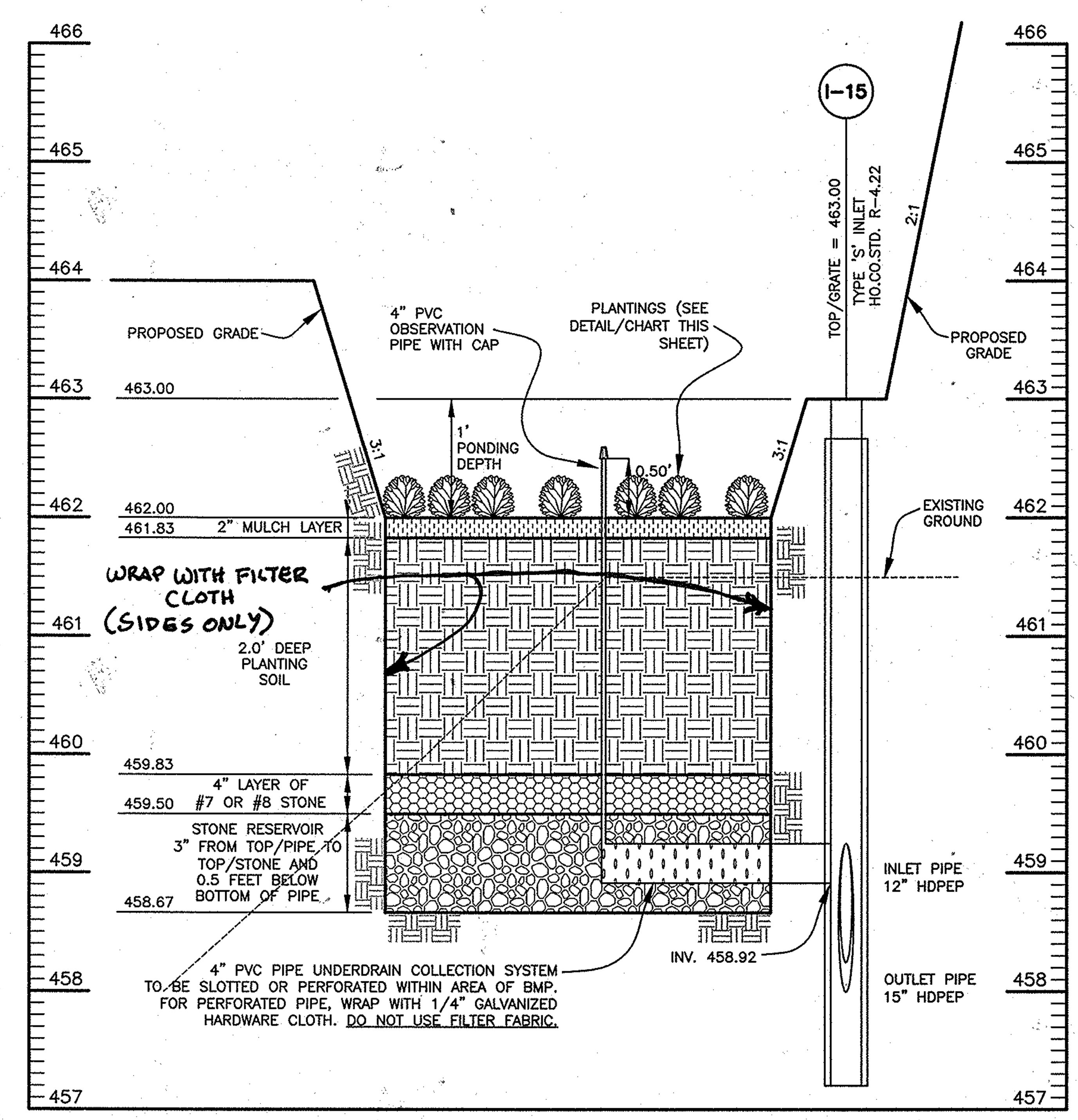


SCHEMATIC PLATING DETAIL FOR
(M-6) MICRO-BIORENTION & (F-6) BIORETENTION FACILITIES
NOT TO SCALE

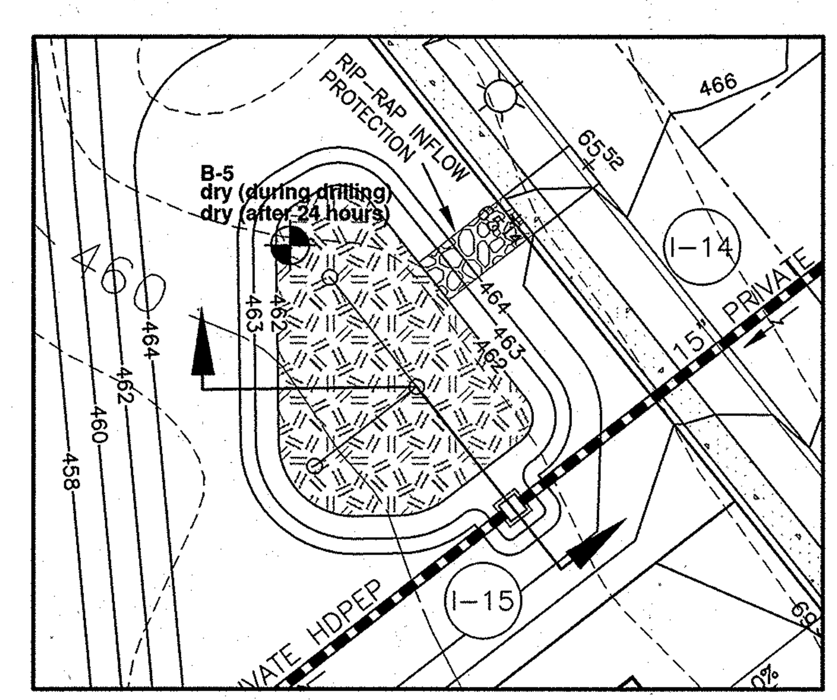
(M-6) MICRO-BIORETENTION AND (F-2) BIORETENTION FACILITY INTERNAL LANSCAPING CHART

				MICRO #1	BIO #1	BIO #2	BIO #3	BIO #4	BIO #5	TOTAL
Facility square footage	→			1011	1457	2420	1620	2340	1708	10556
PLANT NAME	**COMMON NAME**	**TYPE**	**SIZE**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**	**QUANTITY**
Ilex verticillata	Common Winterberry	shrub	2.5'-3' ht	10	15	24	16	23	17	106
Lobelia cardinalis	Cardinal flower	perennial herbaceous plant	quart bulb	97	97	161	108	156	114	733
Lobelia siphilitica	Great Blue Lobelia	perennial herbaceous plant	quart bulb	97	97	161	108	156	114	733
Carex stricta	Uptight Sedge	grass	quart bulb	97	97	161	108	156	114	733
Iris versicolor	Blue Water Iris	perennial herbaceous plant	quart bulb	97	97	161	108	156	114	733
Liatris spicata	Prairie Gay Feather	perennial herbaceous plant	quart bulb	97	97	161	108	156	114	733

Shrubs planted at roughly 1 per 100 suare feet
Plants and grasses platnined a 1 per 3 square feet



CROSS-SECTION THROUGH
(M-6) MICRO-BIORETENTION #1
SCALE: 1"=10' HORZ., 1"=1' VERT.



PLAN VIEW
(F-6) BIORETENTION FACILITY #3
SCALE: 1"=20'

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9.10.15

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND — PROFESSIONAL ENGINEER 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
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VILLAGES AT TURF VALLEY
PHASE 5
LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS
(M-6) MICRO-BIORETENTION & (F-6)
BIORETENTION FACILITIES

DATE:	AUGUST, 2015	BEI PROJECT NO.	2601
SCALE:	AS SHOWN	SHEET	9 OF 18

DESIGN: DBT DRAFT: DBT

F-15-079

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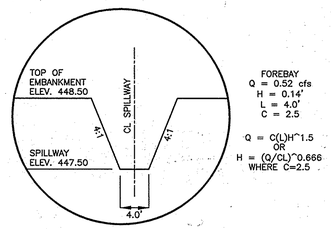
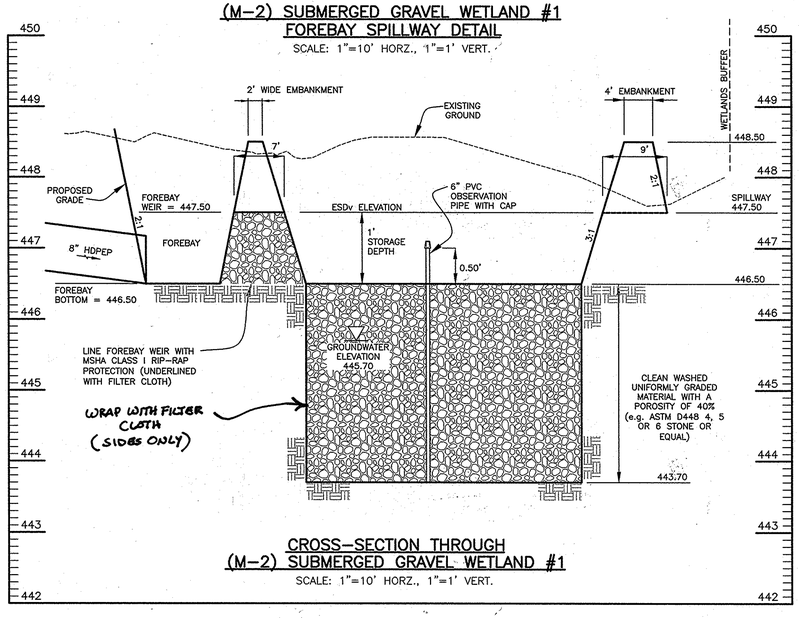


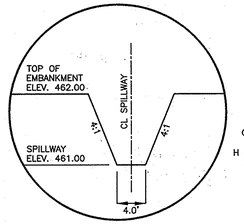
(M-2) SUBMERGED GRAVEL WETLAND #1 FOREBAY SPILLWAY DETAIL

SCALE: 1"=10' HORZ., 1"=1' VERT.



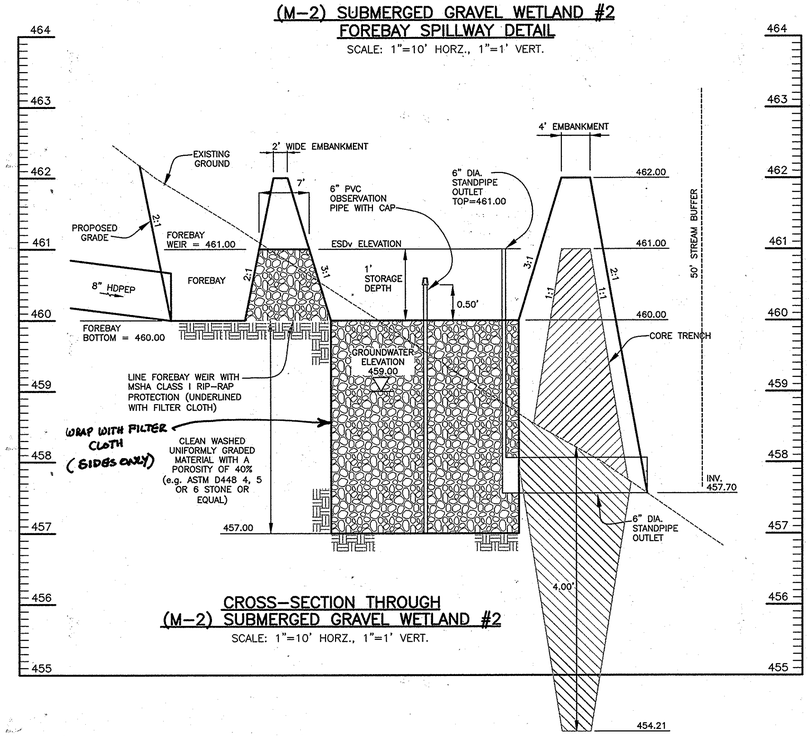
CROSS-SECTION THROUGH (M-2) SUBMERGED GRAVEL WETLAND #1

SCALE: 1"=10' HORZ., 1"=1' VERT.



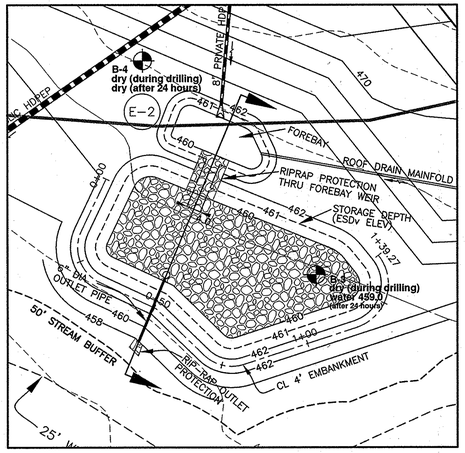
(M-2) SUBMERGED GRAVEL WETLAND #2 FOREBAY SPILLWAY DETAIL

SCALE: 1"=10' HORZ., 1"=1' VERT.



CROSS-SECTION THROUGH (M-2) SUBMERGED GRAVEL WETLAND #2

SCALE: 1"=10' HORZ., 1"=1' VERT.

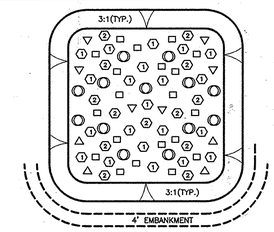


PLAN VIEW (M-2) SUBMERGED GRAVEL WETLAND #2

SCALE: 1"=20'

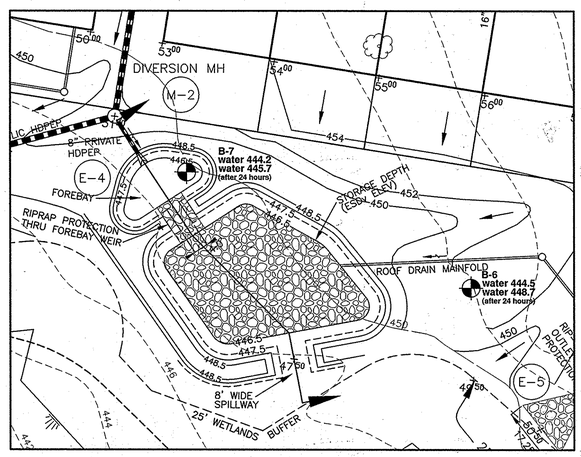
(M-2) SUBMERGED GRAVEL WETLAND PLANTING CHART						
				SGW #1	SGW #2	TOTAL
Facility square footage				1424	1760	
PLANT NAME	COMMON NAME	TYPE	SIZE	QUANTITY	QUANTITY	QUANTITY
Ranunculus subrigidus	Butter-Cup, pond	perennial herbaceous plant	quart bulb	33	41	74
Phlox maculata	Phlox, meadow	perennial herbaceous plant	quart bulb	24	29	53
Lobellia Cardinalis	Cardinal Flower	perennial herbaceous plant	quart bulb	38	47	85
Salix Sericea	Willow, Silky	shrub	2.5'-3' ht	14	18	32
Viburnum Nudum	Viburnum, Possum-haw	shrub	2.5'-3' ht	20	25	45

PLANTING LEGEND	
SYMBOL	NAME
①	BUTTER-CUP, POND RANUNCULUS SUBRIGIDUS
②	PHLOX, MEADOW PHLOX MACULATA
□	CARDINAL FLOWER LOBELIA CARDINALIS
△	WILLOW, SILKY SALIX SERICEA
◎	VIBURNUM, POSSUM-HAW VIBURNUM NUDUM



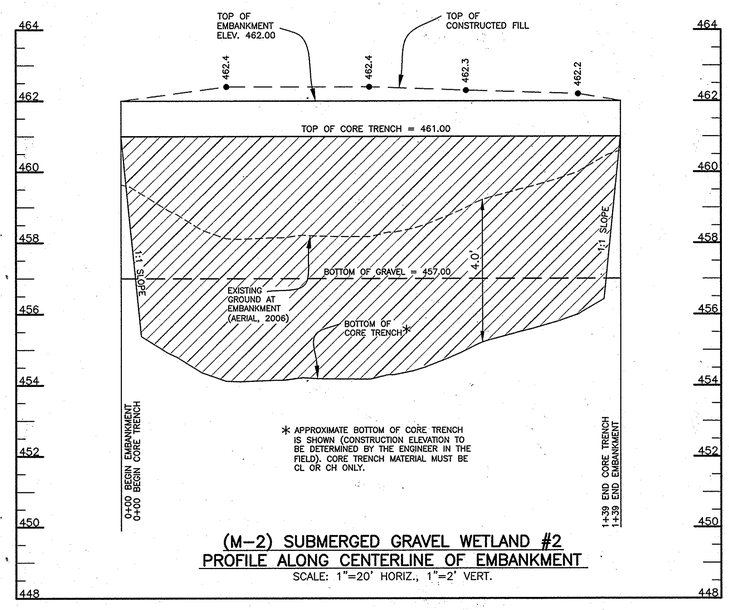
SCHEMATIC PLATING DETAIL FOR (M-2) SUBMERGED GRAVEL WETLANDS

NOT TO SCALE



PLAN VIEW (M-2) SUBMERGED GRAVEL WETLAND #1

SCALE: 1"=20'



(M-2) SUBMERGED GRAVEL WETLAND #2 PROFILE ALONG CENTERLINE OF EMBANKMENT

SCALE: 1"=20' HORIZ., 1"=2' VERT.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SUBMERGED GRAVEL WETLANDS (M-2)

a. During the first year of operation, the Owner shall inspect the facility after every heavy storm and replace vegetation as needed.

b. The Owner shall remove sediment accumulated in the pretreatment areas as necessary.

c. Signs of uneven flow within the wetland may mean that the gravel or underdrain is clogged. The gravel or underdrain shall be removed, cleaned, and replaced, as needed

d. The Owner shall ensure a dense stand of wetland vegetation is maintained through the life of the facility and replace vegetation as needed.

e. The Owner shall ensure the inlets and outlets to each gravel wetland cell are free from debris.

f. The Owner shall repair erosion at inflow points and ensure flow splitters are functional to prevent bypassing the facility.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-18-15

NO.	DATE	REVISION

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(P) 410-465-6105 (F) 410-465-6644
WWW.BD-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22351, Exp. 6-30-2017.

STATE OF MARYLAND — BRIAN D. MASTERS — No. 22351 — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 - GRID: 10 - PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND

STORMWATER MANAGEMENT DETAILS (M-2) SUBMERGED GRAVEL WETLANDS

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 10 OF 18

F-15-079

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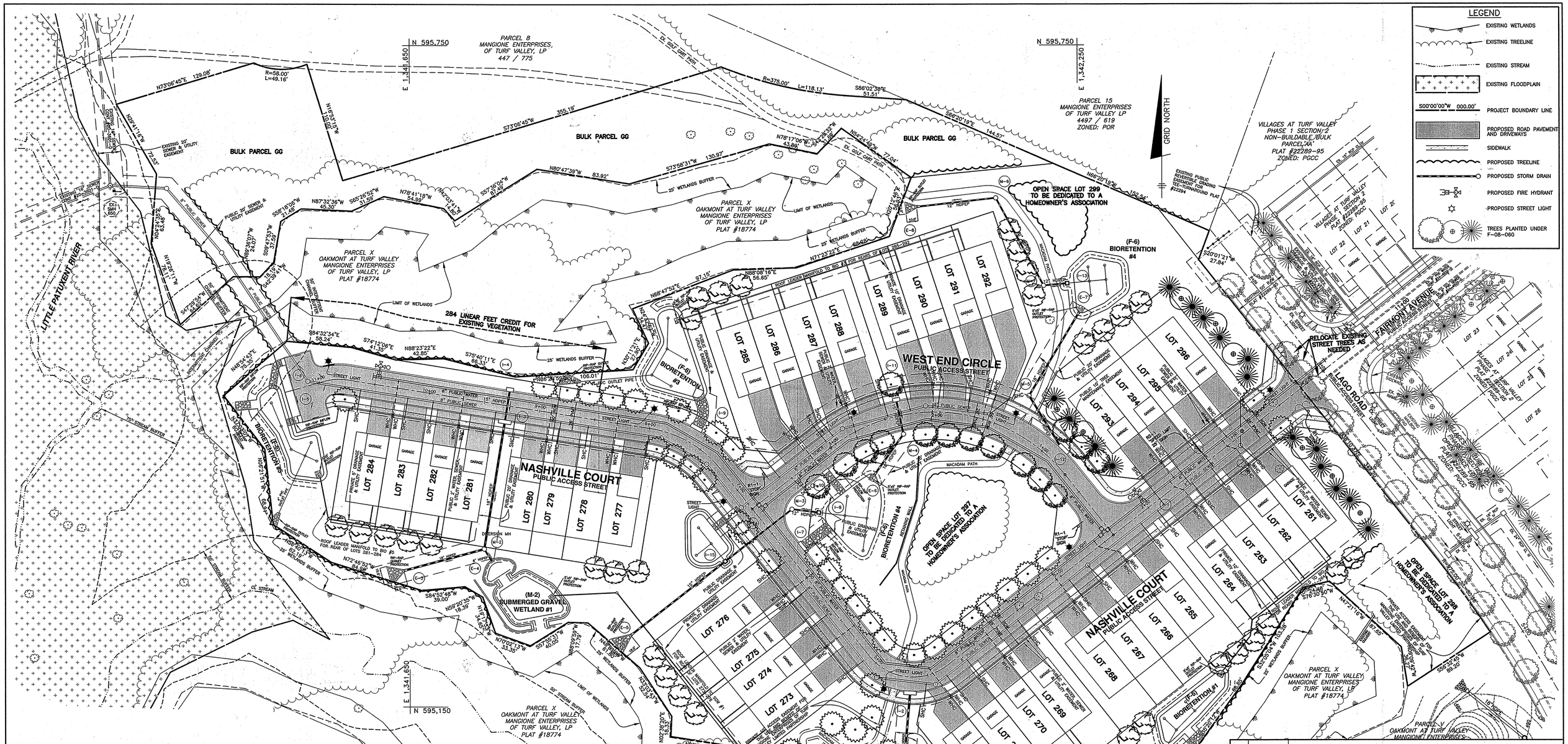

DEVELOPER'S/BUILDER'S CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

DEVELOPER — DATE 8/24/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

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ENGINEERING, INC.
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(P) 410-465-6105 (F) 410-465-6644
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22509, Expiration Date: 6-30-2017.

STATE OF MARYLAND — DAVID BRUCE ALLEN — REG. NO. 22509 — PROFESSIONAL ENGINEER — 8/7/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

PERIMETER LANDSCAPE AND STREET TREE PLAN

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 11 OF 18

F-15-079

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SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROAD (LOT 261) (4)	ADJACENT TO ROAD (LOT 293) (5)	ADJACENT TO ROAD (LOT 296) (5)		TOTALS
LANDSCAPE TYPE	C 1:40 shade 1:20 evergreen	C 1:40 shade 1:20 evergreen	C 1:40 shade 1:20 evergreen		
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	120 LF	80 LF	122 LF		
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO		
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO		
NUMBER OF PLANTS REQUIRED	120 LF	80 LF	122 LF		
SHADE TREES	3	2	3		8
EVERGREEN TREES	6	4	6		16
OTHER TREES (2:1 SUBSTITUTE)	0	0	0		0
SHRUBS	0	0	0		0
NUMBER OF PLANTS PROVIDED					
SHADE TREES	3	2	3		8
EVERGREEN TREES	6	4	6		16
OTHER TREES (2:1 SUBSTITUTE)	0	0	0		0
SHRUBS (10:1 SUBSTITUTE)	0	0	0		0

SCHEDULE C
RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING

NUMBER OF DWELLING UNITS	36
NUMBER OF TREES REQUIRED (1:DU SFA; 1:3 DU APTS)	36
NUMBER OF TREES PROVIDED	
SHADE TREES	36
OTHER (2:1 RATIO)	0

LANDSCAPE NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.

2. STREET TREE LOCATIONS:
   A. WHEN THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS 6 FEET OR GREATER, THE TREES SHALL BE LOCATED WITHIN THE RIGHT-OF-WAY AND SHALL BE CENTERED BETWEEN THE CURB AND SIDEWALK.
   B. WHEN THE DISTANCE BETWEEN THE CURB AND SIDEWALK IS LESS THAN 6 FEET, TREES MAY BE PLANTED 3 FEET FROM THE SIDEWALK IN THE DIRECTION AWAY FROM THE ROAD. A 10-FOOT WIDE TREE MAINTENANCE EASEMENT SHALL BE REQUIRED IF THE RIGHT-OF-WAY IS LIMITED.
   C. TREES SHALL BE PLANTED 6 FEET BEHIND CURB WHEN THERE ARE NO SIDEWALKS.
   D. TREES TO BE PLANTED MINIMUM 30 FEET FROM SIGNS AND INTERSECTIONS WHEN PLANTED BETWEEN SIDEWALK AND CURB. TREES MAY NOT BE PLANTED WITHIN 5 FEET OF A STORM DRAIN INLET, OPEN SPACE ACCESS STRIP, OR 10 FEET OF A DRIVEWAY.

3. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.

4. THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

5. FINANCIAL SURETY IN THE AMOUNT OF $15,600.00 FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT.

PERIMETER LANDSCAPE PLANTING LIST

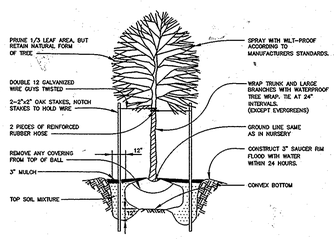
SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	36	CLADRASTIS KENTUKEA LUTEA (Yellowwood)	2.5" – 3"cal.	SHADE TREES FOR INTERNAL LANDSCAPING REQUIREMENT TO BE PROVIDED BY THE BUILDER
	8	PLATANUS X ACERFOLIA (Bloodgood London Plane)	2 1/2" –3" cal.	SHADE TREES ALONG PERIMETER EDGES TO BE PROVIDED BY THE DEVELOPER
	16	CUPPRESSOCYPARIS LEYLANDI (Leyland Cypress)	5' – 6' ht.	EVERGREEN TREES ALONG PERIMETER EDGES TO BE PROVIDED BY THE DEVELOPER

STREET TREE SCHEDULE

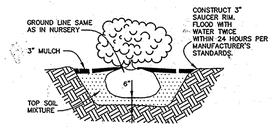
	NASHVILLE COURT	WEST END CIRCLE	TOTAL
LINEAR FEET OF RIGHT-OF-WAY	1883'	591'	
LINEAR FEET OF CREDIT	284'	0	
LINEAR FEET OF REQUIRED PLANTING	1599'	591'	
TREE SIZE	LARGE 1:40 LF	LARGE 1:40 LF	
TREES REQUIRED	40	15	62

STREET TREE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS	DESCRIPTION
	15	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2.5" –3" cal.	TO BE PLANTED ALONG WEST END CIRCLE (PROVIDED BY THE DEVELOPER)
	40	ACER RUBRUM 'RED SUNSET' (Red Sunset Red Maple)	2.5" –3" cal.	TO BE PLANTED ALONG NASHVILLE COURT (PROVIDED BY THE DEVELOPER)



TREE PLANTING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE

DEVELOPER'S/BUILDER'S CERTIFICATE

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DEVELOPER — DATE 8/24/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9.10.15

NO.	DATE	REVISION

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 37884, Expiration Date: 6-30-2017.

STATE OF MARYLAND — CHRIS MAC BRIDE — No. 37884 — REGISTERED PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
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1205 YORK ROAD, PENTHOUSE
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

LANDSCAPE NOTES, CHARTS AND DETAILS

DATE: AUGUST, 2015		BEI PROJECT NO. 2601	
DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN	SHEET 12 OF 18

F-15-079

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LEGEND

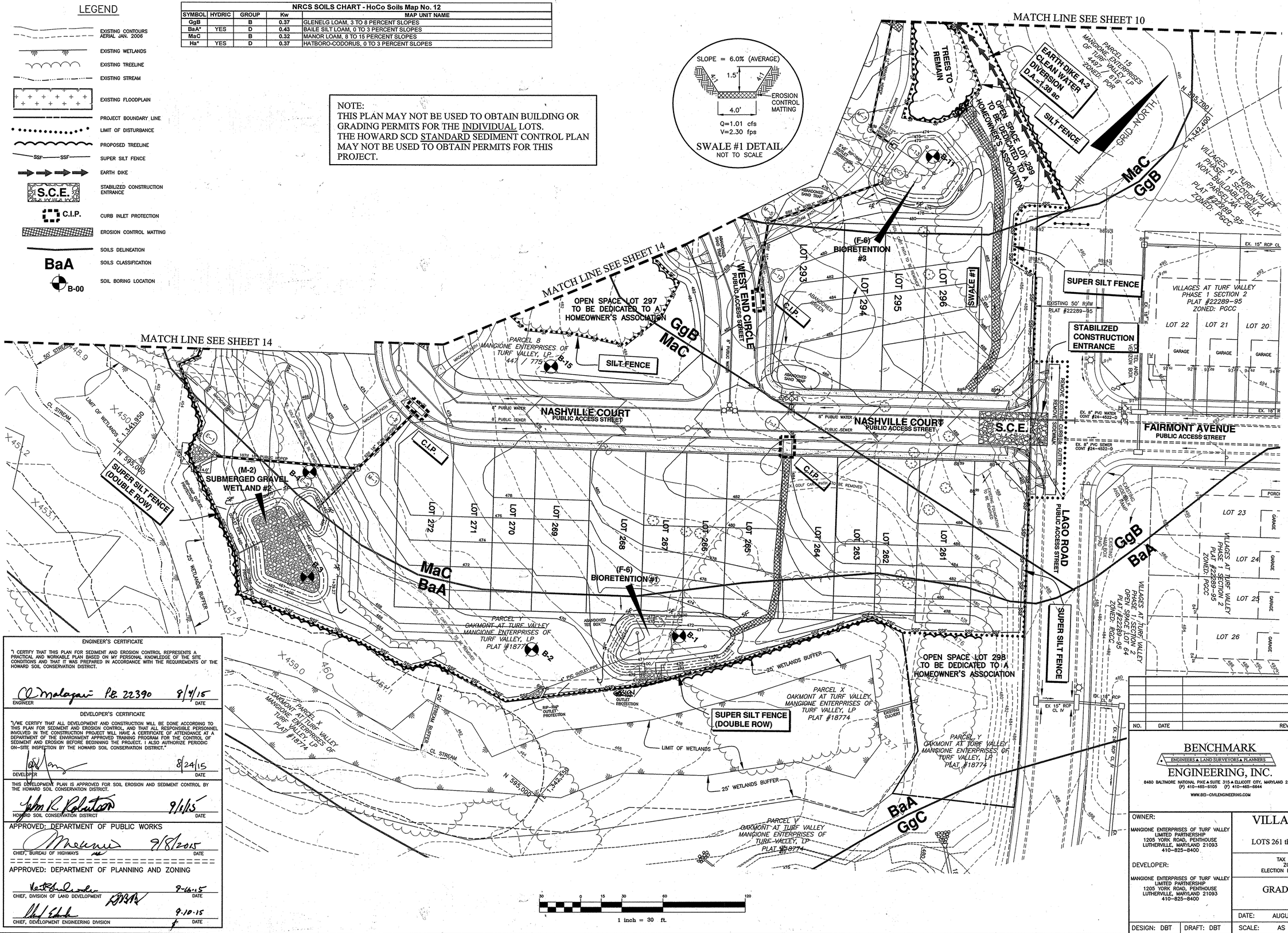
- EXISTING CONTOURS AERIAL JAN. 2006
- EXISTING WETLANDS
- EXISTING TREELINE
- EXISTING STREAM
- EXISTING FLOODPLAIN
- PROJECT BOUNDARY LINE
- LIMIT OF DISTURBANCE
- PROPOSED TREELINE
- SSF — SSF — SUPER SILT FENCE
- EARTH DIKE
- S.C.E. — STABILIZED CONSTRUCTION ENTRANCE
- C.I.P. — CURB INLET PROTECTION
- EROSION CONTROL MATTING
- SOILS DELINEATION
- BaA — SOILS CLASSIFICATION
- B-00 — SOIL BORING LOCATION

NRCS SOILS CHART - HoCo Soils Map No. 12

SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
GgB		B	0.37	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
BaA*	YES	D	0.43	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES
MaC		B	0.32	MANOR LOAM, 8 TO 15 PERCENT SLOPES
Ha*	YES	D	0.37	HATBORO-CODORUS, 0 TO 3 PERCENT SLOPES

NOTE:
THIS PLAN MAY NOT BE USED TO OBTAIN BUILDING OR GRADING PERMITS FOR THE INDIVIDUAL LOTS.
THE HOWARD SCD STANDARD SEDIMENT CONTROL PLAN MAY NOT BE USED TO OBTAIN PERMITS FOR THIS PROJECT.

SWALE #1 DETAIL
NOT TO SCALE



1 inch = 30 ft.

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

C. Malagari P.E. 22390 — ENGINEER — DATE 8/4/15

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER — DATE 8/24/15

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Robertson — HOWARD SOIL CONSERVATION DISTRICT — DATE 9/1/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE, SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND — CHRISTOS MALAGARI — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

GRADING, SEDIMENT & EROSION CONTROL PLAN

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 13 OF 18

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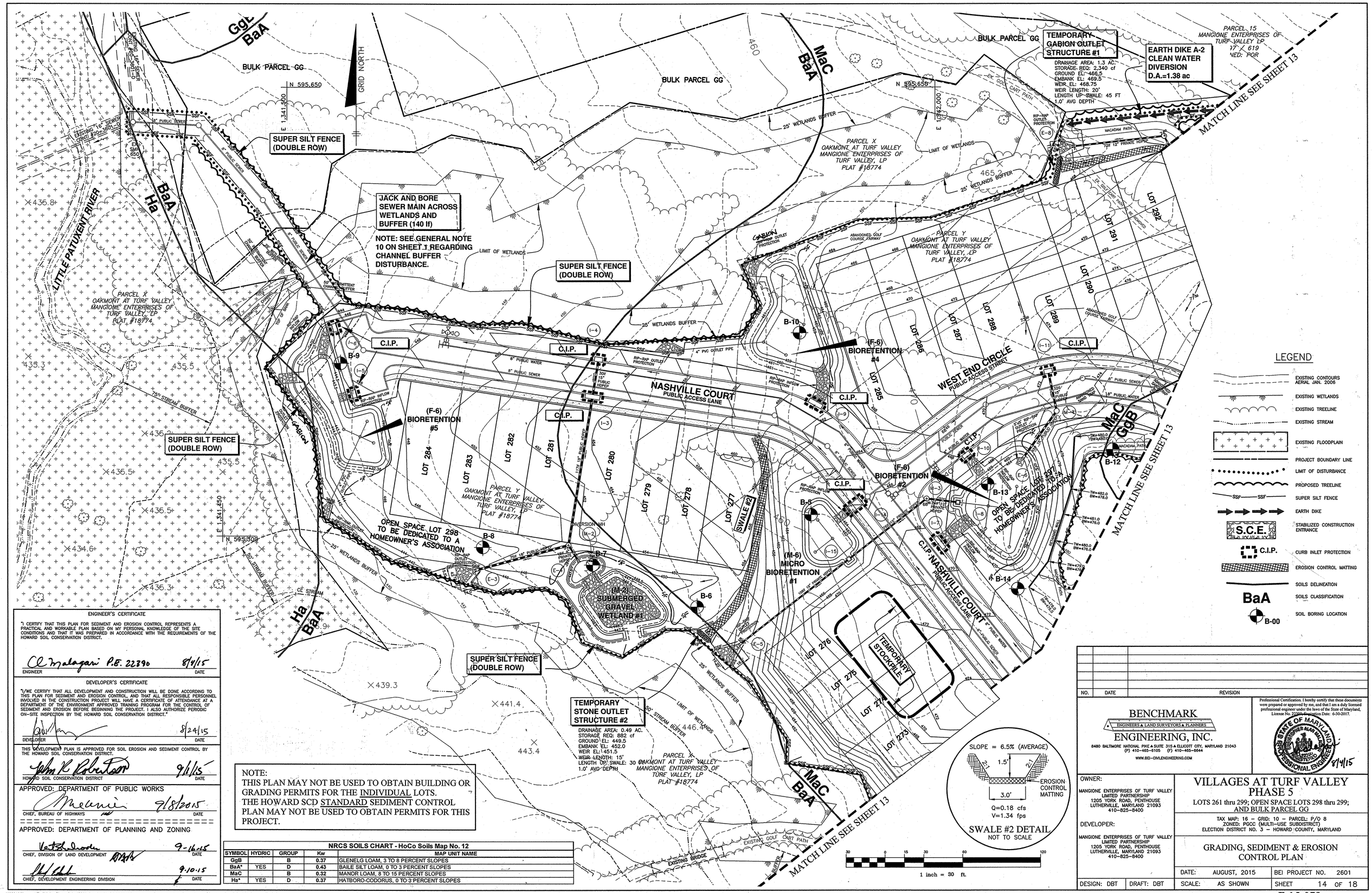

NOTE:
THIS PLAN MAY NOT BE USED TO OBTAIN BUILDING OR GRADING PERMITS FOR THE INDIVIDUAL LOTS.
THE HOWARD SCD STANDARD SEDIMENT CONTROL PLAN MAY NOT BE USED TO OBTAIN PERMITS FOR THIS PROJECT.

NRCS SOILS CHART - HoCo Soils Map No. 12

SYMBOL	HYDRIC	GROUP	Kw	MAP UNIT NAME
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ENGINEER — DATE: 8/4/15

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER — DATE: 8/24/15

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE: 9/1/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE: 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 9-16-15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 9.10.15

NO.	DATE	REVISION

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND — CLAUDIO MALAGARI — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
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DEVELOPER:
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VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 299; OPEN SPACE LOTS 298 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
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GRADING, SEDIMENT & EROSION CONTROL PLAN

DESIGN: DBT	DRAFT: DBT	DATE: AUGUST, 2015	BEI PROJECT NO. 2601
		SCALE: AS SHOWN	SHEET 14 OF 18

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B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition

Establishment of vegetative cover on cut and fill slopes.

Purpose

To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies

Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria

A. Incremental Stabilization - Cut Slopes
1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
   a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
   b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
   c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
   d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

B. Incremental Stabilization - Fill Slopes
1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
   a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
   b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
   c. Place Phase 1 fill, prepare seedbed, and stabilize.
   d. Place Phase 2 fill, prepare seedbed, and stabilize.
   e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

Figure B.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation
1. Temporary Stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
      i. Soil pH between 6.0 and 7.0.
      ii. Soluble salts less than 500 parts per million (ppm).
      iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
      iv. Soil contains 1.5 percent minimum organic matter by weight.
      v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling
1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)
1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

A. Seeding
1. Specifications
   a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
   a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
      i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
      i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
      ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
   c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
      i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
      ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
      iii. Mix seed and fertilizer on site and seed immediately and without interruption.
      iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching
1. Mulch Materials (in order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
   b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
      i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
      ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
      iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
      iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
      v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
      i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
      ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
      iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
      iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures
1. General Use
   a Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
   b Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guild, Section 342 - Critical Area Planting.
   c For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
   d For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
2. Turfgrass Mixtures
   a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
   b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
      i. Kentucky Bluegrass: Full sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
      ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
      iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
      iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 ½ to 3 pounds per 1000 square feet.
      Notes: Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland" Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.
   c. Ideal Times of Seeding for Turf Grass Mixtures
      Western MD: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
      Central MD: March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
      Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)
   d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 ½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
   e. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is not especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

B. Sod: to provide quick cover on disturbed areas (2:1 grade or flatter).
1. General Specifications
   a. Class of turfgrass must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
   b. Sod must be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
   c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
   d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
   e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
2. Sod Installation
   a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
   b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
   c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
   d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
3. Sod Maintenance
   a. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moist soil to a depth of 4 inches. Water sod during the heat of the day to prevent wilting.
   b. After the first week, sod watering is required as necessary to maintain adequate moisture content.
   c. Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by the initial cutting or subsequent cuttings. Maintain a grass height of at least 3 inches unless otherwise specified.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABLIZATION

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

H-5 STANDARDS AND SPECIFICATIONS FOR DUST CONTROL

Definition

Controlling the suspension of dust particles from construction activities.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

Conditions Where Practice Applies

Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

5. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

6. SITE ANALYSIS:

TOTAL AREA OF SITE:	10.49	ACRES
AREA DISTURBED:	8.9	ACRES
AREA TO BE ROOFED OR PAVED:	1.2	ACRES
AREA TO BE VEGETATIVELY STABILIZED:	7.7	ACRES
TOTAL CUT:	12,999	CY*
TOTAL FILL:	25,007	CY*
OFFSITE WASTE/BORROW LOCATION:	SITE WITH AN ACTIVE GRADING PERMIT	

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

9. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.

11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.

12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 ACRES PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

*CUT/FILL NUMBERS ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR TO VERIFY.

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate 1/ lb/ac	Seeding Rate 1/ lb/1000 ft2	Seeding Depth 2/ (inches)	Recommended Seeding Dates by Plant Hardiness Zone 3/ 5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (Lolium perenne ssp. Multiflorum	40	1.0	0.5		Mar 1 to May 15; Aug 1 to Oct 31	
Barley (Hordeum vulgare)	96	2.2	1.0		Mar 1 to May 15; Aug 1 to Oct 31	
Oats (Avena sativa)	72	1.7	1.0		Mar 1 to May 15; Aug 1 to Oct 31	
Wheat (Triticum aestivum)	120	2.8	1.0		Mar 1 to May 15; Aug 1 to Oct 31	
Cereal Rye (Secale cereale)	112	2.8	1.0		Mar 1 to May 15; Aug 1 to Nov 15	
Warm-Season Grasses						
Foxtail Millet (Serataria italica)	30	0.7	0.5		May 16 to Jul 31	
Pearl Millet (Pennisetum glaucum	20	0.5	0.5		May 16 to Jul 31	

Notes:

1/ Seeding rates for the warm season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

2/ For sandy soils, plant seeds at twice the depth listed above.

3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

Permanent Seeding Summary

Hardiness Zone (from Figure B.3): 6b

Seed Misture (from Table B.3): Tall Fescue/Kentucky Bluegrass

No.	Species	Application Rate (lb/ac.)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20) N	P2O5	K2O	Lime Rate
9	Fescue, Tall	60	Mar 1 to May 15 Aug 1 to Oct 15	1/4 - 1/2 in	45 pounds per acre (1.0 lb/ 100 sf)	90 lb/ac (2 lb/ 1000 sf)	90 lb/ac 2 lb/ 1000 sf)	2 tons/ac (90lb/ 1000 sf)
	Bluegrass, Kentucky	40	Mar 1 to May 15 Aug 1 to Oct 15	1/4 - 1/2 in				
				1/4 - 1/2 in				

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Cl Malagari P.E. 22390 — 8/4/15

ENGINEER — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

8/24/15

DEVELOPER — DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson — 9/1/15

HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

9/8/2015

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

9-16-15

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

9.10.15

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF WORK

1. Obtain grading permit. (day 1)

2. Hold on-site pre-construction meeting. (day 2)

3. Clear and Grub as necessary to install stabilized construction entrance and perimeter controls (clean water diversion dike, super silt fences, TGOS, TSOS etc.). Install the clean water dike prior to installation of the TGOS. (day 3-6)

4. Upon approval from the Howard County sediment control inspector, proceed to clear, grub and grade within the perimeter. (day 7-10)

5. Install new sewer line from ex SMH 650 up to proposed SMH 3. Utilize a jack and bore between proposed SMH's 2 and 3 in order to avoid disturbance to the wetlands and wetlands buffer. (day 11-18)

6. Bring roadbed to subgrade and at the same time begin mass grading of the lots. (day 19-28)

7. Complete installation of rest of the water and sewer mains. Install the house connections. (day 29-55)

8. Install the storm drain system from E-1 to I-2, E-3 to I-4, E-5 to I-8 and E-8 to I-13. Install the rip-rap outlet protection. Block the 8" HDPEP pipes at M-1 and M-2 so that runoff will not enter those pipes. Utilize inlet protection/blocking for the inlets. (day 56-70)

9. Construct the Bio-retention Facilities, Micro Bio-retention practice and the Submerged Gravel Wetlands. Complete with underdrain outfalls. Do NOT install the plantings at this time. Also, ensure that the swale east of Lot 277 and the swale east of Lot 296 have been graded at this time in order to avoid excess runoff from entering the Submerged Gravel Wetland #1 and Bio-Retention #3. Ensure swales discharge to the TGOS and TSOS. Once Submerged Gravel Wetlands are constructed, the 8" pipes can be unblocked. (day 71-90)
ADD SILT FENCE TO UPHILL SIDE OF ALL SWM PRACTICES TO PREVENT SILT FROM ENTERING.

10. Install the all remaining storm drain pipes and structures. Utilize inlet protection. Install related inflow and outflow rip-rap protection at the structures as indicated on the plans. (day 91-100)

11. Install curb and gutter. (day 101-105)

12. Install base paving for the roads. (day 106-110)

13. Complete mass grading of the lots and stabilize in accordance with the permanent seedbed notes. (day 111-115)

14. Install the sidewalks. (day 116-120)

15. Once all lot areas have been permanently stabilized, install the final plantings for the Bio-retention, Micro Bio-retention and the Submerged Gravel Wetlands. (day 121-125)

16. Install street trees and perimeter landscape trees. (day 126-130)

17. Upon approval from the Howard County Sediment Control Inspector, remove all sediment control devices and stabilize any remaining disturbed areas in accordance with the permanent seedbed notes. (day 121-133)

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.

ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER — 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

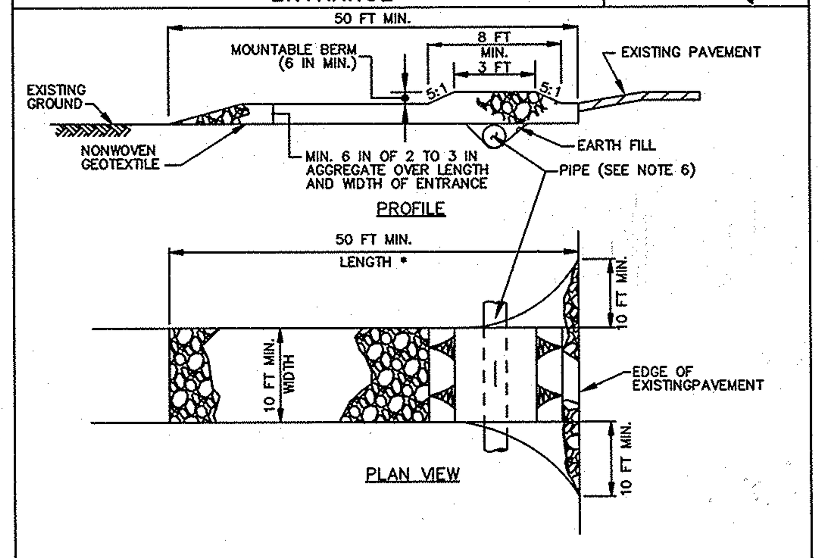
SEDIMENT & EROSION CONTROL NOTES

DATE: AUGUST, 2015	BEI PROJECT NO. 2601		
DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN	SHEET 15 OF 18

F-15-079

DETAIL B-1 — STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



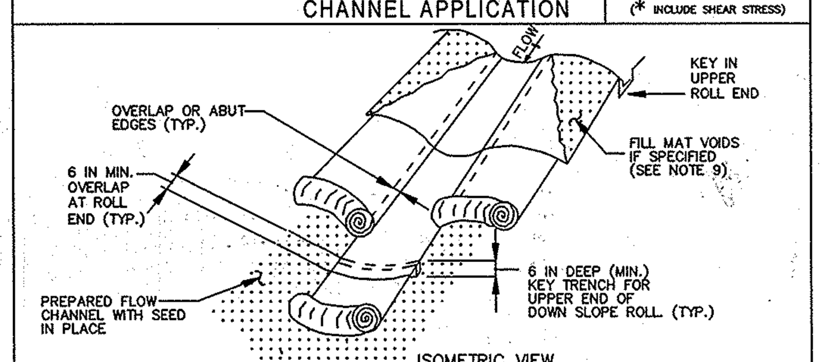
CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-C — PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: PSSMC – * lb/ft² (* INCLUDE SHEAR STRESS)



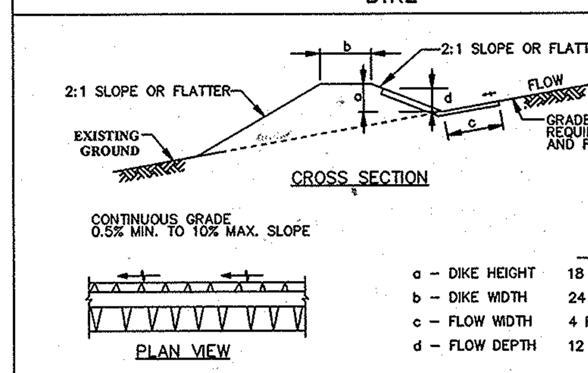
CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 — EARTH DIKE

STANDARD SYMBOL: A-1 (PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.)



DIKE TYPE

	A	B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

- A-1 — SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
- A-2/B-2 — SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
- A-3/B-3 — 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

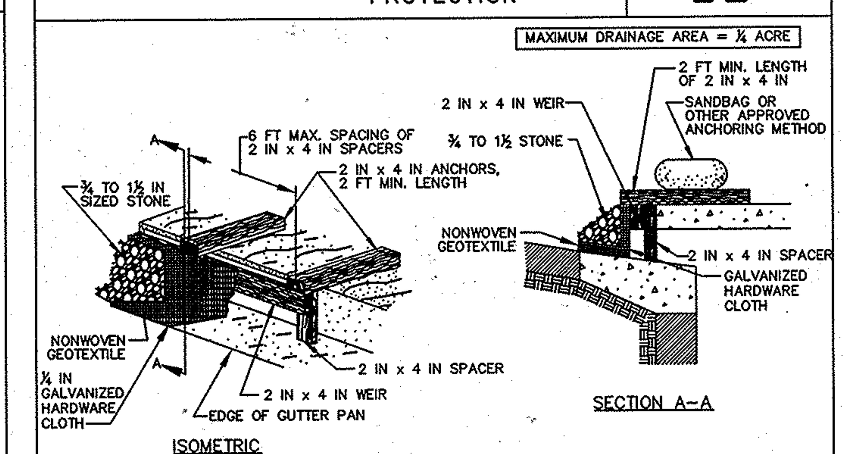
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-3 — CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON-SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

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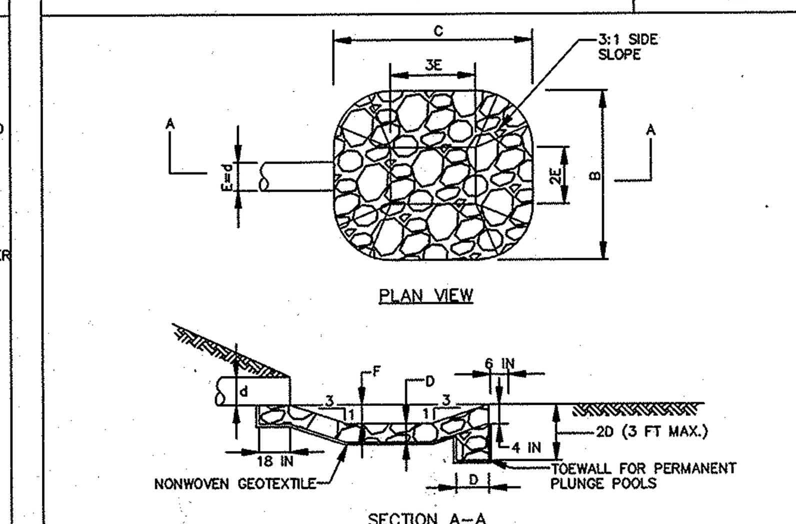
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-4-2 — PLUNGE POOL

STANDARD SYMBOL: PP



CONSTRUCTION SPECIFICATIONS

1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
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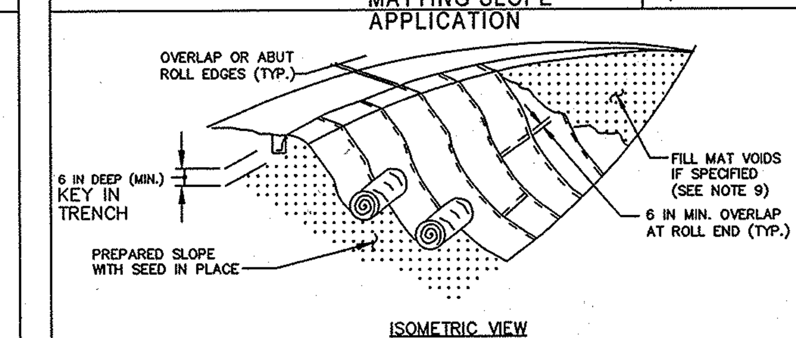
DETAIL B-4-6-D — PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: PSSMS – * lb/ft² (* INCLUDE SHEAR STRESS)



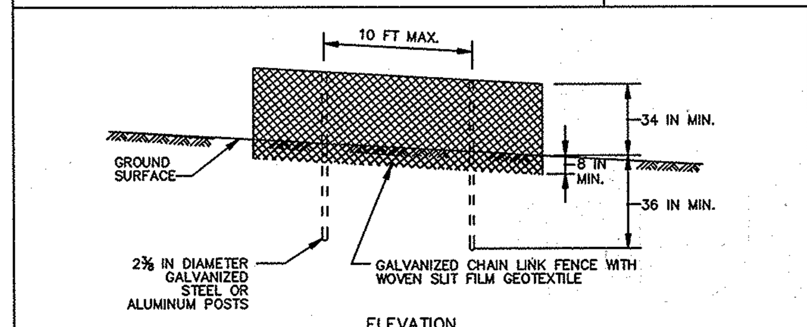
CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

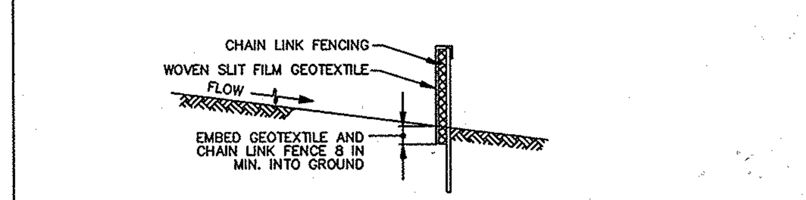
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 — SUPER SILT FENCE

STANDARD SYMBOL: SSF



ELEVATION



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
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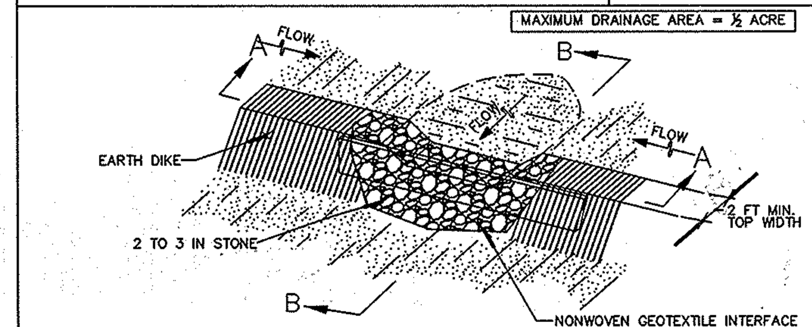
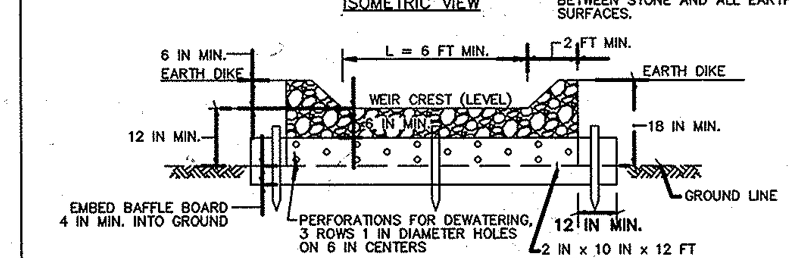
DETAIL E-7 — TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

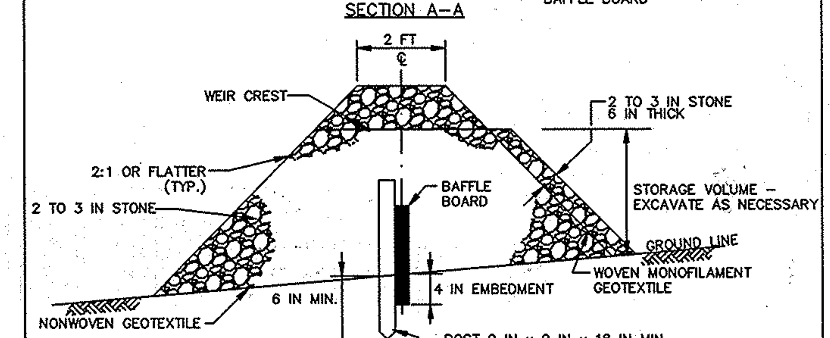
MAXIMUM DRAINAGE AREA = ½ ACRE



ISOMETRIC VIEW



SECTION A–A



SECTION B–B

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-7 — TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE NONWOVEN GEOTEXTILE ON INTERFACE BETWEEN GROUND AND STONE.
3. PERFORATE BAFFLE BOARD WITH 3 ROWS OF 1 INCH DIAMETER HOLES 6 INCHES ON CENTER, EMBED A MINIMUM OF 4 INCHES INTO GROUND, AND EXTEND BAFFEL BOARD MINIMUM OF 12 INCHES INTO EARTH DIKE.
4. USE CLEAN 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE WOVEN MONOFILAMENT GEOTEXTILE ON UPSTREAM FACE AND COVER WITH A MINIMUM OF 6 INCHES OF ADDITIONAL STONE.
5. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
6. SET WEIR CREST OF STONE 6 INCHES LOWER THAN THE TOP OF EARTH DIKE. USE MINIMUM LENGTH OF 6 FEET FOR WEIR CREST.
7. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 6 INCHES OF WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO DRAIN. MAINTAIN LINE, GRADE, AND CROSS SECTION.
8. UPON REMOVAL OF STONE OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
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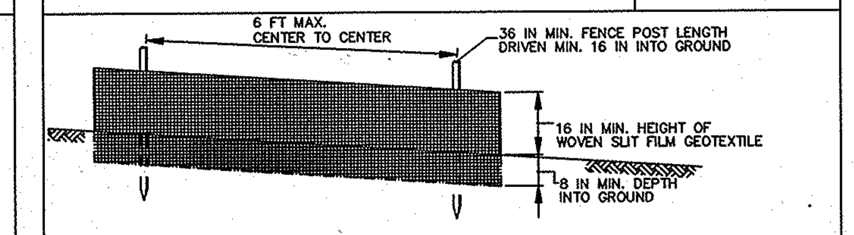
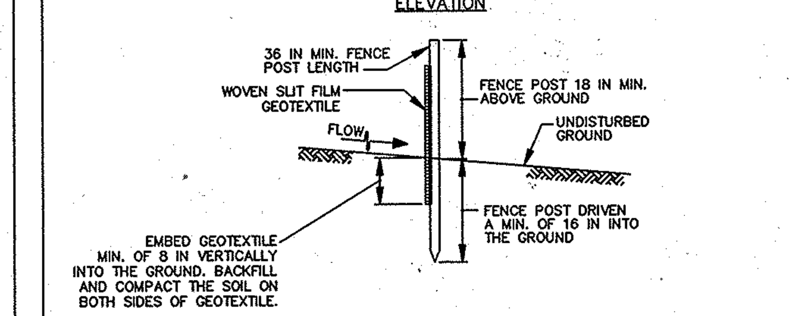
DETAIL E-1 — SILT FENCE

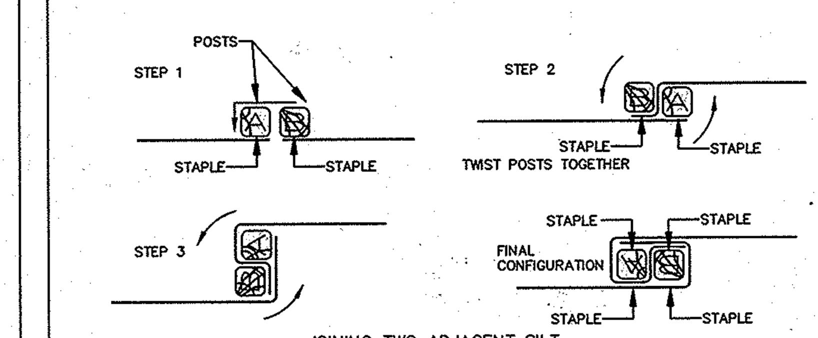
STANDARD SYMBOL: SF



ELEVATION



CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

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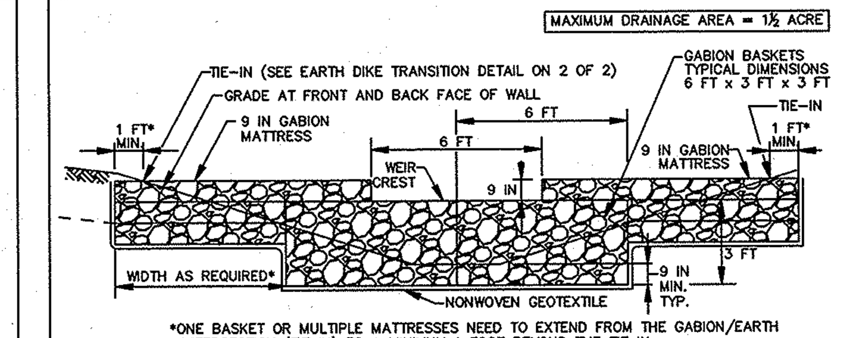
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 — TEMPORARY GABION OUTLET STRUCTURE

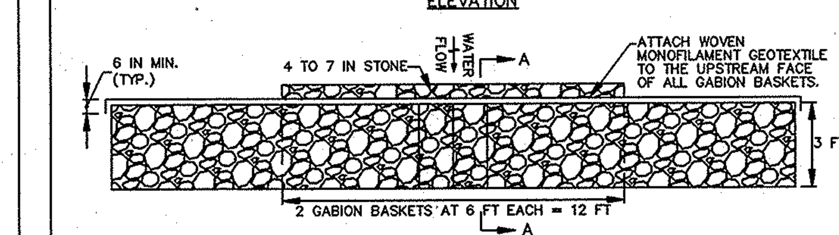
STANDARD SYMBOL: TGOS

MAXIMUM DRAINAGE AREA = 1½ ACRE

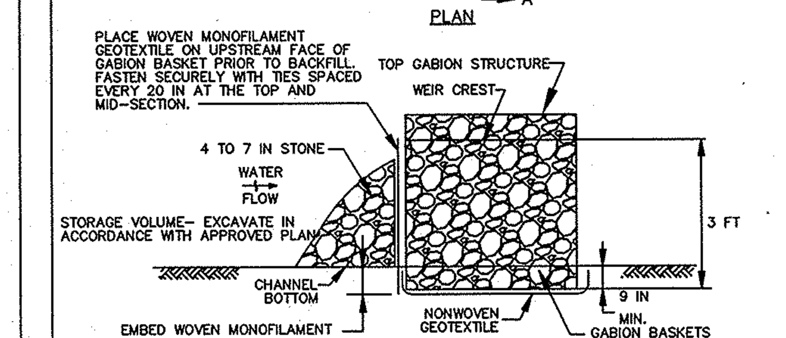


*ONE BASKET OR MULTIPLE MATTRESSES NEED TO EXTEND FROM THE GABION/EARTH INTERSECTION (TIE IN) TO A MINIMUM 1 FOOT BEYOND THE TIE IN.

ELEVATION



PLAN



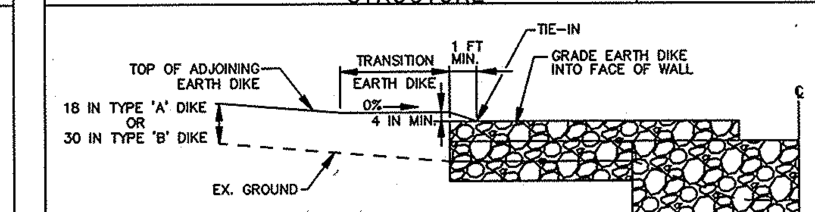
SECTION A–A

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 — TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL: TGOS



EARTH DIKE TRANSITION

NOTES:

1. PROVIDE TRANSITION LENGTH AND HEIGHT AS SPECIFIED ON PLAN. HEIGHT OF TRANSITION EARTH DIKE MUST EXCEED 4 INCH MINIMUM FREEBOARD ABOVE TOP OF GABION AND EXTEND AT THIS ELEVATION UNTIL IT INTERCEPTS THE TOP OF ADJOINING EARTH DIKE.
2. PROVIDE POSITIVE DRAINAGE ALONG EARTH DIKE TO GABION OUTLET STRUCTURE.
3. COMPACT FILL.
4. SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED ON PLAN. BANK PROJECTIONS OR IRREGULARITIES ARE NOT ALLOWED.

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
3. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
4. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
5. EMBED THE GABION OUTLET STRUCTURE INTO THE SOIL A MINIMUM OF 9 INCHES. PROVIDE NONWOVEN GEOTEXTILE UNDER ALL GABIONS.
6. FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WIRE MESH.
7. MAKE THE WEIR CREST OF THE GABION OUTLET STRUCTURE 9 INCHES LOWER THAN THE TOP OF THE ADJACENT GABIONS.
8. PROVIDE A MINIMUM WEIR CREST OF 6 FEET.
9. ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF GABION BASKETS AND COVER WITH 4 TO 7 INCH STONE.
10. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 12 INCHES OF THE WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO FUNCTION. MAINTAIN LINE, GRADE, AND CROSS SECTION.
11. UPON REMOVAL OF GABION OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

C. Malagari P.E. 22390 — 8/4/15
ENGINEER — DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

[signature] — 8/24/15
DEVELOPER — DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Robertson — 9/1/15
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

[signature] — 9/8/2015
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] — 9-16-15
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] — 9.10.15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.

[Seal: STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER] 8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5

LOTS 261 thru 296; OPEN SPACE LOTS 297 thru 299; AND BULK PARCEL GG

TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

SEDIMENT & EROSION CONTROL DETAILS

DATE: AUGUST, 2015		BEI PROJECT NO. 2601	
DESIGN: DBT	DRAFT: DBT	SCALE: AS SHOWN	SHEET 16 OF 18

F-15-079

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-1
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 472.3 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown, moist, medium stiff, silty CLAY with some sand and roots (CL-ML) Possible Fill	2" Topsoil	10"		2-4-2	6
Brown, moist, loose to medium dense, silty SAND with mica and rock fragments (SM) Possible fill		18"		4-5-5	10
		18"		3-5-6	11
Brown, moist, loose sandy Silt with mica (ML)	Backfilled after 24 hours.	16"		3-3-5	8
Bottom of boring at 8.5'					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. 6.3 ft; AFTER ___ HRS. ___ ft
CAVE IN DEPTH: 6.5 ft; 7.0 ft; ___ ft
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGER; DC - DRIVING CASING; MD - MUD DRILLING

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-2
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 467.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Orange/Brown, moist, medium stiff, fine sandy CLAY, trace fine roots and mica (CL)	2" Topsoil	13"		2-4-4	8
Gray/Brown, moist, loose, fine silty SAND with mica (SM)		18"		5-3-6	9
Red/Brown, moist, loose, sandy SILT with mica (ML)		18"		3-4-5	9
Brown/Gray/White, moist, medium dense, fine silty SAND, with mica (SM)	Backfilled after 24 hours.	18"		5-8-10	18
Bottom of boring at 9.5'.					

GROUND WATER: AT COMPLETION 7.7 ft; AFTER 24 HRS. 4.5 ft — CAVE IN DEPTH: 7.6 ft; 6.5 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-3
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 464.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Tan/Brown, moist, very loose clayey SAND with roots (SC)	2" Topsoil	10"		1-2-2	4
Gray/Brown, moist, loose to medium dense silty SAND (SM)		18"		3-3-5	8
		18"		4-6-11	17
Gray/Brown/White loose silty SAND with rock fragments (SM)	Backfilled after 24 hours.	18"		6-5-4	9
Bottom of boring at 8.5'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. 1.0 ft — CAVE IN DEPTH: 7.0 ft; 3.0 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-4
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 462.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown/Orange, moist, medium stiff CLAY (CL) Possible fill	2" Topsoil	14"		1-3-3	6
Brown/Orange, moist, medium stiff clayey SILT (CL-ML)	Backfilled after 24 hours.	18"		3-4-4	8
Bottom of boring at 5.0'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 2.5 ft; 2.0 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-5
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 462.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown, moist, loose silty SAND with mica and roots (SM) Fill	2" Topsoil	10"		3-4-5	9
		18"		4-4-5	9
Brown, moist, loose silty SAND, with mica and rock fragments (SM)	Backfilled after 24 hours.	8"		12-50/5"	62
Bottom of boring at 7.5'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 5.0 ft; 4.6 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-6
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 452.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown to Tan/Gray, moist, soft to stiff clayey SILT, with roots and mica (ML)	2" Topsoil	13"		2-3-2	5
		18"		3-3-3	6
		18"		4-5-7	12
Dark Brown, moist, loose micaceous sandy SILT (ML)	Backfilled after 24 hours.	17"		2-3-3	6
Bottom of boring at 10.5'.					

GROUND WATER: AT COMPLETION 7.4 ft; AFTER 24 HRS. 4.5 ft — CAVE IN DEPTH: 8.0 ft; 3.3 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-7
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6 Foreman T. Carroll
Surf. Elev. 450.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Dark Brown, moist, medium stiff SILT with mica and roots (ML) Possible fill	2" Topsoil	5"		3-3-3	6
Tan/Brown, moist, loose silty SAND, with mica (SM)		18"		2-2-3	5
Dark Brown/Tan, very moist, loose, micaceous sandy SILT (ML)		18"		2-3-4	7
Brown/White, moist, loose silty SAND with trace mica (SM)		18"		3-2-4	6
	Backfilled after 24 hours.	18"		3-3-3	6
Bottom of boring at 12.5'.					

GROUND WATER: AT COMPLETION 5.8 ft; AFTER 24 HRS. 4.3 ft — CAVE IN DEPTH: 7.2 ft; 5.8 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-8
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 446.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Orange/Brown, moist soft clay with trace mica (CL) Possible Fill	2" Topsoil	15"		2-2-3	5
Brown, moist, soft sandy CLAY, with mica (CL)		9"		2-2-2	4
Orange/Brown, moist, very loose to loose sandy SILT with mica (ML/SM)		10"		3-2-3	5
	Backfilled after 24 hours.	14"		4-3-4	7
Bottom of boring at 10.5'.					

GROUND WATER: AT COMPLETION 7.4 ft; AFTER 24 HRS. 3.0 ft — CAVE IN DEPTH: 8.4 ft; 5.3 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-9
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 443.5 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/5/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/5/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Dark Gray, moist, soft CLAY, with some sand (CL)	2" Topsoil	8"		1-2-3	5
Red/Gray, moist, stiff, clayey SILT with some sand and rock fragments (ML)		10"		4-5-7	12
Red/Dark Brown to Dark Brown/White, moist, medium dense sandy SILT with rock fragments (ML/SM)		14"		6-5-10	15
	Backfilled after 24 hours.	12"		3-5-6	11
Bottom of boring at 9.0'.					

GROUND WATER: AT COMPLETION 6.3 ft; AFTER 24 HRS. ___ ft — CAVE IN DEPTH: 6.4 ft; ___ ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-10
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 464.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/5/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/5/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown, moist, soft silty CLAY with roots (ML-CL) Possible Fill	2" Topsoil	14"		2-2-3	5
Dark Brown, moist, medium stiff SILT, with rock fragments, roots and mica (ML)		12"		4-3-5	8
Dark Brown, moist, medium dense sandy SILT with mica and rock fragments (ML)		13"		5-6-8	14
	Backfilled after 24 hours.	15"		7-12-10	22
Bottom of boring at 8.5'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. ___ ft — CAVE IN DEPTH: 5.6 ft; ___ ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-11
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 477.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/5/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/5/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Dark Gray, moist, medium stiff sandy CLAY (CL)	2" Topsoil	13"		3-3-5	8
Brown to Gray, moist, loose to dense sandy SILT to silty SAND with mica (ML/SM)		18"		3-3-4	7
		18"		3-4-5	9
		18"		6-14-21	35
	Backfilled after 24 hours.	18"		9-13-16	29
Bottom of boring at 13.5'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. ___ ft — CAVE IN DEPTH: 8.4' ft; ___ ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-12
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 482.5 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown, moist, loose clayey SAND (SC)	2" Topsoil	13"		2-4-4	8
Black/Brown to Brown/White, moist, medium dense to very dense silty SAND, with rock fragments (SM) Decomposed Rock		11"		4-8-13	21
		12"		22-36-50/4"	86+
		7"		26-50/4"	76+
Brown/White, moist, very dense micaceous sandy SILT (ML) Decomposed Rock		15"		21-29-34	63
		18"		14-30-43	73
	Backfilled after 24 hours.	14"		21-36-50/4"	86+
Bottom of boring at 24.0'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 20.2 ft; 19.7 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-13
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 475.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown/Orange, moist, loose, clayey SAND with roots (SC)	2" Topsoil	18"		1-3-2	5
Orange/Brown, moist, loose, silty SAND (SM)		15"		3-4-6	10
Orange/Brown, moist, loose sandy SILT to silty SAND (ML-SM)		18"		4-4-4	8
Dark Brown, moist, medium dense sandy SILT (ML)		18"		5-7-6	11
Gray, moist, dense silty SAND (SM) Decomposed Rock	Backfilled after 24 hours.	10"		23-50/5"	73+
Bottom of boring at 17.0' Auger refusal					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 12.0 ft; 11.5 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-14
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 474.0 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown, moist, very loose, clayey SAND (SC)	2" Topsoil	14"		1-2-2	4
Brown, moist, medium dense, silty SAND with mica (SM)		14"		3-5-7	12
		18"		5-10-13	23
Brown/White, moist, very dense silty SAND with mica and rock fragments (SM)		18"		26-41-33	74
Decomposed Rock	Backfilled after 24 hours.	18"		31-34-29	63
Bottom of boring at 12.5'.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 8.0 ft; 7.8 ft

ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Turf Valley Phase 5 SWM — Boring No. B-15
Location: Howard County, Maryland — Job # 14114A

SAMPLER
Datum ___ Hammer Wt. 140 lbs. Hole Diameter 6" Foreman T. Carroll
Surf. Elev. 482.5 ft Hammer Drop 30 in. Rock Core Diameter ___ Inspector ___
Date Started 3/4/14 Pipe Size 2 in. Boring Method HSA Date Completed 3/4/14

Description	Boring and Sampling Notes	Rec.	NM%	SPT Blows	N
Brown/Orange, moist, very loose clayey SAND with roots (SC) Possible Fill	2" Topsoil	14"		2-2-2	4
Black, very moist, very loose sandy SILT (ML) Possible Fill		6"		2-1-2	3
Brown/Orange, moist, very loose, silty SAND (SM)		7"		2-2-3	5
Dark Brown, moist, medium dense, sandy SILT with rock fragments (ML)		18"		6-9-19	28
	Backfilled after 24 hours.	18"		10-11-14	25
Bottom of boring at 17.0'. Auger refusal.					

GROUND WATER: AT COMPLETION Dry ft; AFTER 24 HRS. Dry ft — CAVE IN DEPTH: 11.5 ft; 11.0 ft

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 9/8/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9-16-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9-10-15

NO.	DATE	REVISION

BENCHMARK ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 22390, Expiration Date: 6-30-2017.
8/4/15

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY PHASE 5
LOTS 261 thru 299; OPEN SPACE LOTS 298 thru 299; AND BULK PARCEL GG

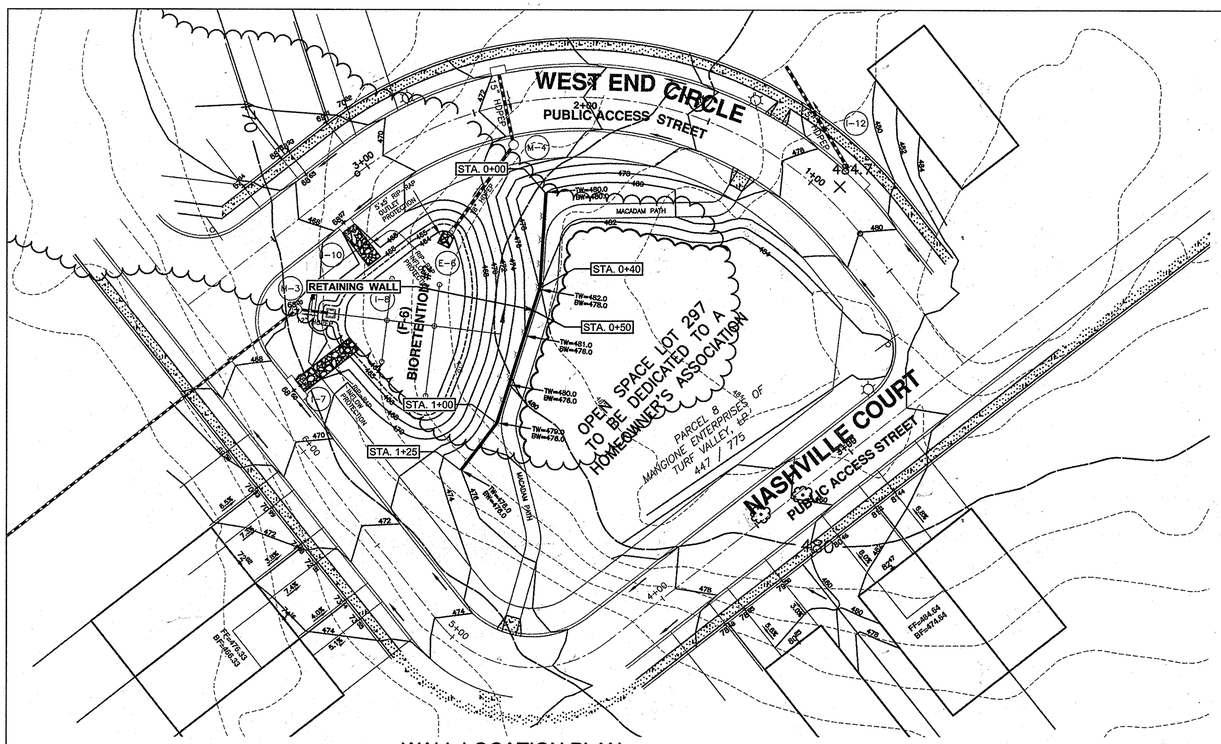
TAX MAP: 16 – GRID: 10 – PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 – HOWARD COUNTY, MARYLAND

SOIL BORING LOGS

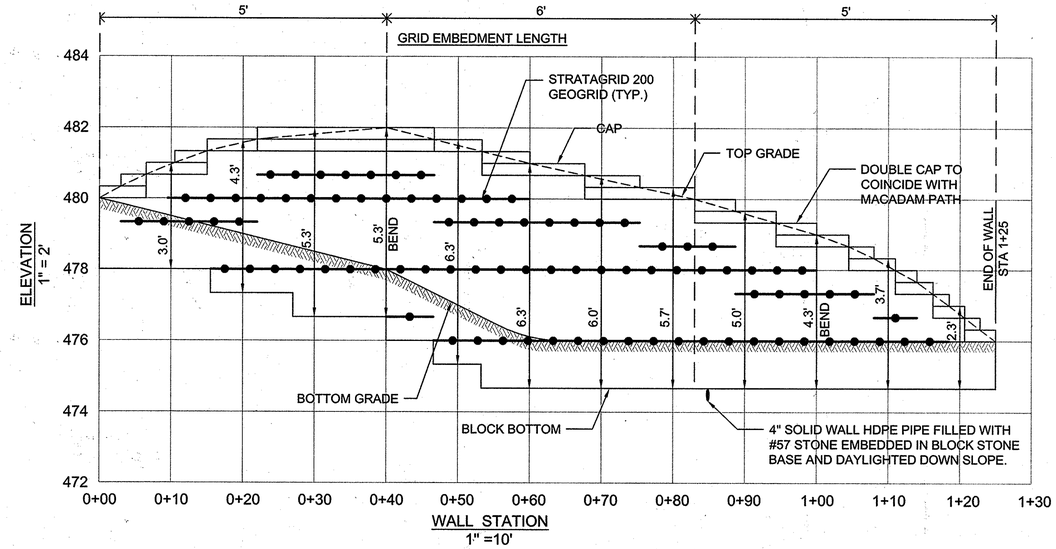
DATE: AUGUST, 2015 — BEI PROJECT NO. 2601
DESIGN: DBT — DRAFT: DBT — SCALE: NONE — SHEET 17 OF 18

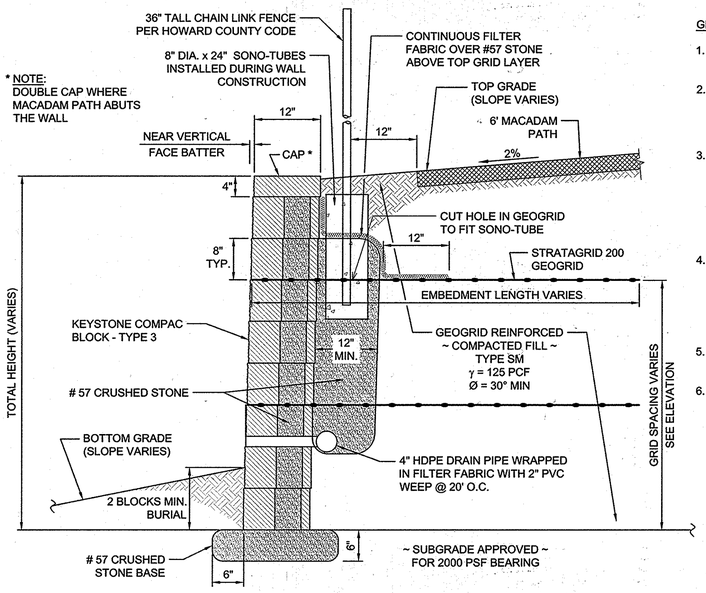
F-15-079

J:\2601 Villages at Turf Valley Phase 5\dwg\7026.dwg, 8/4/2015 9:26:49 AM



WALL LOCATION PLAN
1" = 30'





TYPICAL WALL SECTION
N.T.S.

GENERAL NOTES:

1. No trees shall be planted within 10 feet of the top of the retaining wall.
2. Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACEL, or equiv.) certified soils technician.
3. The required bearing pressure beneath the wall system shall be verified in the field by a certified soils technician. Testing documentation must be provided to the Howard County Inspector prior to start of construction. The required bearing test shall be the Dynamic Cone Penetrometer test ASTM STP-399.
4. The suitability of fill material shall be confirmed by the on-site soils technician. Each 8" lift must be compacted to a minimum 95% standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
5. Walls shall not be constructed on uncertified fill materials.
6. Walls shall not be constructed within a Howard County right-of-way or easement.

SPECIFICATIONS

MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

A. Work shall consist of furnishing and construction of a Modular Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.

B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.

C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Delivery, Storage and Handling

A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.

B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the following architectural requirements:

face color - color may be specified by the Owner.

face finish - sculptured rock face in angular tri-planer or flat configuration. Other face finishes will not be allowed without written approval of Owner.

bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.

exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.

B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.

C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:

compressive strength = 3000 psi minimum; absorption = 8% maximum (6% in northern states) for standard weight aggregates;

dimensional tolerances = ±1/8" from nominal unit dimensions not including rough split face, ±1/16"

unit height - top and bottom planes; unit size - 8" (H) x 18" (W) x 12 (D) minimum;

unit weight - 75 lbs/unit minimum for standard weight aggregates;

inter-unit shear strength - 1000 plf minimum at 2 psi normal pressure; at 2 psi normal force.

geogrid/unit peak connection strength - 1000 plf minimum

D. Modular concrete units shall conform to the following constructability requirements:

vertical setback = 1/8"± per course (near vertical) or 1"+ per course per the design; alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;

maximum horizontal gap between erected units shall be - 1/2 inch.

2.02 Shear Connectors

A. Shear connectors shall be 1/2 inch diameter thermoset isopthalic polyester resin-protruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 100 degrees F. B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.03 Base Leveling Pad Material

A. Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

2.04 Unit Drainage Fill

A. Unit drainage fill shall consist of #57crushed stone

2.05 Reinforced Backfill

A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-35

Plasticity Index (PI) <10 and Liquid Limit <35 per ASTM D-4318.

B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

2.06 Geogrid Soil Reinforcement

A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn.

2.07 Drainage Pipe

A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

PART 3 EXECUTION

3.01 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall be responsible for inspecting and approving the excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.

B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.

B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

C. Install shear/connecting devices per manufacturer's recommendations.

D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed three courses.

3.04 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.

B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.

C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.

B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.

C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be + 3% to - 3% of optimum.

D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.

E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.

G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 Field Quality Control

A. The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.

B. As a minimum, quality assurance testing should include foundation soil inspection, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

NO.	DATE	REVISION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 9-10-15
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 9-16-15
DIRECTOR	DATE

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

Professional Certification: I hereby certify that these plans were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14434, Expiration Date: 05/13/17.

STATE OF MARYLAND — RICHARD W. STURGIS — No. 14434 — PROFESSIONAL ENGINEER

OWNER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

DEVELOPER:
MANGIONE ENTERPRISES OF TURF VALLEY, LIMITED PARTNERSHIP
1205 YORK ROAD, PENTHOUSE
LUTHERVILLE, MARYLAND 21093
410-825-8400

VILLAGES AT TURF VALLEY
PHASE 5
LOTS 261 thru 299; OPEN SPACE LOTS 298 thru 299;
AND BULK PARCEL GG

TAX MAP: 16 - GRID: 10 - PARCEL: P/O 8
ZONED: PGCC (MULTI-USE SUBDISTRICT)
ELECTION DISTRICT NO. 3 - HOWARD COUNTY, MARYLAND

RETAINING WALL PLAN, PROFILE AND DETAILS

DATE: AUGUST, 2015	HCEA PROJECT NO. 14452-A
SCALE: AS SHOWN	SHEET 18 OF 18

F-15-079